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Problem Identification for Highway Safety Plan (FY 1982)

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16. Abstract

To comply with Section 402, Title 23 of the United States Code, each state is required to prepare an annual highway safety program. Kentucky's program, which includes identification, programming, budgeting, and evaluation of highway safety projects, is intended to have a positive impact on the reduction of traffic accidents. The first step in the program, problem identification, requires systematic, statistical analyses of accident records. In-depth analyses of accident data were performed, and 24 problem areas were investigated. Accident rates were found for counties and cities in the following categories: total accidents; fatal accidents; accidents by driver age and sex; and speed-, alcohol-, and drug-related accidents. In addition, rates were reported for motor-vehicle accidents involving pedestrians, bicycles, motorcycles, school buses, commercial buses, combination trucks, single-unit trucks, railroad trains, and emergency vehicles.

This is the third report on problem identification prepared for the Office of Highway Safety Programs. The past two reports were included in Kentucky's Annual Highway Safety Plans for Fiscal Years 1980 and 1981.

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Introduction

The U. S. Department of Transportation requires each state to prepare an annual highway safety program to comply with requirements of Section 402, Title 23 of the United States Code. Kentucky's program, which includes the identification, programming, budgeting, and evaluation of safety projects, is intended to have an impact through the reduction of traffic accidents. The first step in programming is problem identification; this requires systematic statistical analyses of accident records. The objective of this report, therefore, was to identify problem areas in highway safety for which the greatest potential exists for reducing accidents. In-depth analyses of accident data, along with available normalizing data, were performed; 24 problem identification areas were investigated:

County Accident Statistics,
City Accident Statistics,
General Accident Statistics,
Fatal Accident Statistics,
Accident Statistics by Driver Age and Sex,
Driver Records,
Speed-Related Accidents,
Alcohol-Related Accidents,
Drug-Related Accidents,
License Restrictions and Handicapped Drivers,
Seatbelt Usage,
Child Restraints,
55-mph Speed Limit,
Pedestrians,
Bicycles,
Motorcycles,
School Buses,
Commercial Buses,
Combination Trucks,
Single-Unit Trucks,
Railroads,
Emergency Vehicles,
Vehicle Defects, and
Emergency Services Arrival Times.

The RAPID computer software package was used in the process. Total computer cost of summarizing 1979 data to add to the previous data was about $520, and CPU time was approximately 50 minutes. In addition, data from past accident studies were used to supplement data in the current files.

This is the third report on problem identification prepared for the Office of Highway Safety Programs. The past two reports were included in Kentucky's Annual Highway Safety Plans for Fiscal Years 1980 and 1981. In addition, the reports were published as Research Reports 521 and 543 (1, 2). A summary of Report 543 will also be published by the Transportation Research Board.

Problem Areas Investigated

County Accident Statistics

A basic analysis used in identifying high-accident areas involved a calculation of accident rates by county as shown in Table 1. Rates were calculated for each of Kentucky's 120 counties in terms of several measures of exposure, including population, vehicle-miles, licensed drivers, and registered vehicles. Rates in terms of vehicle-miles were used primarily in subsequent analysis. Rates of accidents per 100 million vehicle-miles were calculated using total accidents, fatal accidents only, and injury-or-fatal accidents only. The rates were calculated using 1978 and 1979 data. The basis for the vehicle-miles statistics was a previous research report that summarized traffic accidents in Kentucky in 1978 (3). In that report, total vehicle-miles driven were given by county for 1978. A factor was applied to the 1978 vehicle-miles to estimate 1979 mileage for all highways except interstates, where actual volume counts were used. County populations were obtained from preliminary 1980 census data. The number of licensed drivers by

Table 1. Accident Rates by County (1978 and 1979 data).

COUNTY	TOTAL NUMBER OF ACCIDENTS	POPULATION	ANNUAL ACCIDENTS PER 1000 POPULATION	VEHICLE MILES (100 MILLION)	ACCIDENTS PER 100 MILLION VEHICLE MILES	NUMBER OF LICENSED DRIVERS	ANNUAL ACCIDENTS PER 1000 LICENSED DRIVERS	NUMBER OF REGISTERED VEHICLES	ANNUAL ACCIDENTS PER 1000 REGISTERED VEHICLES	NUMBER OF FATAL ACCIDENTS	FATAL ACCIDENTS PER 100 MILLION VEHICLE MILES	NUMBER OF FATAL AND INJURY ACCIDENTS	FATAL AND INJURY ACCIDENTS PER 100 MILLION VEHICLE MILES
Adair	672	15,123	22.2	1.1673	342	7,588	44.2	10,199	32.9	1	0.21	137	69.6
Allen	588	14,048	20.6	1.6470	352	7,715	37.6	10,435	27.7	10	6.07	159	96.5
Anderson	848	12,555	33.8	1.6590	455	7,149	59.3	9,729	43.6	2	1.77	261	108.1
Ballard	505	10,115	25.0	1.7407	290	5,653	46.8	7,564	35.4	8	4.60	164	94.2
Barren	2,585	33,713	38.3	5.1021	507	18,856	68.5	27,655	46.7	16	3.53	659	129.2
Bath	331	9,994	16.6	1.2812	258	5,303	31.2	7,253	22.7	4	3.12	84	65.6
Bell	1,870	32,255	29.0	4.7416	394	14,774	63.3	20,744	90.1	20	4.22	471	99.3
Boone	5,865	45,560	64.4	8.0266	731	24,842	116.0	35,329	83.0	28	3.49	1,192	148.5
Bourbon	1,547	19,360	40.0	2.6235	590	10,751	71.9	14,445	53.5	17	6.48	417	158.9
Boyd	6,135	55,451	55.3	8.3623	734	32,852	93.3	43,453	70.6	16	1.91	1,059	126.6
Boyle	2,223	24,977	44.5	3.2805	676	14,245	78.0	18,761	59.2	8	2.43	352	119.1
Bracken	203	7,743	13.1	.8665	234	4,276	23.7	5,301	19.1	5	5.77	32	36.9
Breathitt	688	16,945	20.3	2.3392	294	6,884	50.0	9,361	36.7	13	5.56	245	104.7
Breckenridge	868	16,862	25.7	2.2204	391	9,251	46.9	12,962	33.4	6	2.70	197	83.7
Bullitt	2,325	43,150	26.9	5.7429	405	20,982	55.4	30,029	38.7	21	3.66	636	110.7
Butler	494	11,232	22.4	1.5454	254	5,755	42.6	8,273	28.1	13	6.63	159	81.7
Caldwell	1,036	13,473	38.5	2.6143	396	8,362	61.8	11,801	43.9	7	2.68	234	85.5
Calloway	2,060	29,995	34.7	3.7167	559	16,553	62.8	31,471	33.0	16	4.30	467	125.9
Campbell	8,688	82,645	52.6	7.2358	1,201	45,809	94.8	56,110	77.4	17	2.35	1,426	197.1
Carlisle	225	5,465	20.5	1.1061	203	3,579	31.4	4,832	23.0	6	5.42	79	71.4
Carroll	1,061	9,287	57.1	1.7462	607	5,202	102.0	7,113	74.5	14	8.01	228	130.4
Carter	1,245	25,029	24.9	3.3350	373	11,370	52.4	16,865	36.9	16	4.80	314	94.2
Casey	507	14,761	17.2	1.6249	312	7,750	32.7	10,663	23.8	5	3.08	127	78.2
Christian	4,858	66,265	36.7	9.8169	496	28,137	86.5	39,167	62.1	26	2.65	980	97.8
Clark	2,795	28,334	49.3	3.3573	832	15,727	88.9	21,956	64.2	9	2.68	542	161.4
Clay	950	22,659	21.0	2.8012	339	9,055	52.4	13,042	36.4	11	3.93	225	80.3
Clinton	313	9,058	17.3	1.1537	270	4,773	32.8	6,357	24.6	5	4.33	86	74.2
Crittenden	508	9,225	27.5	1.3416	378	5,616	45.2	7,595	33.4	5	3.73	141	105.1
Cumberland	286	7,334	19.8	.9169	312	3,624	37.4	4,855	29.5	1	1.09	54	58.9
Daviess	9,793	85,702	57.1	10.9785	892	52,203	83.8	69,939	72.1	31	2.82	1,659	151.1
Edmonson	409	10,002	20.5	1.4654	279	5,610	36.4	7,070	28.9	6	4.09	140	95.5
Elliott	253	6,842	18.5	.7542	335	3,148	40.2	3,916	32.3	3	3.98	67	88.8
Estill	621	14,506	21.4	1.3657	455	7,652	40.6	10,453	29.7	6	4.39	125	91.5
Fayette	24,653	203,082	60.7	28.6311	861	102,518	120.2	152,067	81.1	52	1.82	4,675	163.3
Fleming	590	12,332	23.9	1.6870	350	6,322	46.7	10,560	27.9	11	6.52	153	90.7
Floyd	2,360	48,533	24.3	5.3009	445	20,404	57.8	28,207	41.8	20	3.77	617	116.4
Franklin	4,118	41,731	49.3	4.5509	905	24,199	85.1	32,132	64.1	11	2.42	736	161.7
Fulton	579	8,965	32.3	4.1003	141	5,376	53.9	7,255	39.8	2	0.49	111	27.1
Gallatin	386	4,817	40.1	1.4432	266	2,605	74.1	4,647	41.2	6	4.14	120	82.9
Garrard	678	10,648	31.3	1.5466	436	6,108	55.5	7,389	43.0	10	6.47	183	118.3
Grant	1,189	13,286	44.8	3.4334	345	7,656	77.7	10,955	54.3	5	1.46	358	104.3
Graves	2,508	34,156	36.7	5.2634	476	20,839	60.2	28,591	43.9	20	3.80	563	107.0
Grayson	1,357	20,451	33.2	3.0576	444	11,006	61.6	15,715	43.2	8	2.62	309	101.1
Green	547	10,954	25.0	1.5011	364	6,162	44.4	7,953	34.3	6	4.00	141	93.9
Greenup	2,152	38,846	27.7	4.4225	487	20,933	51.4	28,398	37.9	9	2.04	512	115.8
Hancock	330	7,710	21.4	1.0953	301	4,431	36.8	6,181	26.7	2	1.83	81	74.0
Hardin	5,347	88,928	30.1	13.7935	388	34,850	76.7	54,086	48.4	25	1.81	1,279	92.7
Harlan	2,141	41,993	25.5	4.0631	527	18,624	54.0	24,654	43.4	22	5.41	453	121.3
Harrison	1,084	15,133	35.8	1.7695	612	9,180	59.0	11,994	45.2	5	2.83	182	102.8
Hart	788	15,127	26.1	2.7700	284	8,525	45.2	10,654	37.0	12	4.33	229	82.7
Henderson	4,859	40,797	59.6	6.1690	788	24,376	99.7	33,562	72.4	26	4.21	1,026	166.3
Henry	677	12,687	26.7	2.3245	291	7,194	47.1	9,953	34.0	7	3.01	177	76.1
Hickman	303	6,068	25.0	1.1840	256	3,820	39.7	5,170	29.3	3	2.53	94	79.4
Hopkins	3,894	46,097	42.2	7.9056	492	26,402	73.7	40,232	48.4	15	1.90	858	108.5
Jackson	359	11,932	15.0	1.2839	280	5,342	33.6	7,045	25.5	8	6.23	83	64.6
Jefferson	76,081	681,351	55.8	90.2291	843	376,887	100.9	480,935	79.5	194	2.15	12,486	138.2
Jessamine	1,699	26,045	32.6	3.0450	558	12,794	66.4	17,783	47.8	12	3.94	317	104.1
Johnson	1,473	24,317	30.3	3.3973	434	11,589	63.6	16,674	44.2	13	3.83	315	92.7
Kenton	15,886	136,150	68.7	15.0143	1,063	71,293	112.2	89,839	89.0	26	1.73	2,658	190.4
Knott	621	17,871	17.4	2.0142	308	7,657	40.6	9,076	34.2	15	7.45	202	100.3
Knox	1,366	29,946	22.8	4.0295	339	13,060	52.3	15,387	44.4	21	5.21	386	95.8
Larue	672	11,844	28.4	2.2643	297	7,038	47.7	9,087	36.9	11	4.86	177	78.2
Laurel	2,659	38,402	34.6	4.5405	586	18,629	71.4	24,305	54.7	23	4.75	581	120.0
Lawrence	835	14,134	29.5	2.8595	292	6,226	67.1	8,475	49.3	6	2.10	213	74.5
Lee	234	7,660	15.3	.8120	288	3,667	31.9	4,955	23.4	4	4.93	57	70.2
Leslie	386	14,821	13.4	1.6781	235	5,819	34.0	6,773	29.2	15	8.94	146	87.0
Letcher	840	30,253	13.9	3.5972	233	14,166	29.6	18,835	22.8	18	5.00	280	72.3
Lewis	671	14,518	23.1	1.5197	441	6,956	48.2	9,262	35.2	6	3.95	186	122.4
Lincoln	803	18,973	21.2	3.0082	267	9,783	41.0	12,895	31.1	8	2.66	196	65.2
Livingston	446	9,252	24.1	1.6537	270	5,380	41.4	8,527	26.2	4	2.42	129	78.0
Logan	1,626	24,059	33.8	3.4287	474	13,515	60.2	18,795	43.4	14	4.08	480	128.3
Lyon	308	6,502	23.7	1.2673	243	3,435	44.9	3,912	39.4	4	3.16	91	71.8
McCracken	6,207	61,229	50.7	10.2301	607	40,102	77.4	52,336	59.3	22	2.15	1,054	103.0
McCreary	497	15,557	16.0	1.8244	272	6,608	37.6	8,665	28.6	13	7.13	136	74.5
McLean	412	10,056	20.5	1.5415	267	6,252	32.9	9,116	22.6	4	2.59	143	92.8
Madison	4,935	53,315	46.3	7.1739	688	23,676	104.2	33,967	72.6	19	2.65	823	114.7
Magoffin	522	13,455	19.4	1.6490	316	5,760	45.3	6,421	40.6	8	4.85	156	118.9
Marion	1,340	17,618	38.0	1.6753	800	9,417	71.1	12,364	54.2	7	4.18	265	158.2
Marshall	1,653	25,636	32.2	5.8776	281	16,029	51.4	26,113	31.7	13	2.21	448	76.2
Martin	379	13,924	13.6	1.7178	221	5,903	32.1	8,215	23.1	6	3.49	98	57.0
Mason	2,185	17,534	62.3	2.5070	872	9,634	113.4	13,356	81.8	11	4.39	356	142.8
Meade	1,238	22,856	27.1	2.8069	441	8,726	70.9	13,201	46.9	16	5.70	369	131.5
Menifee	170	5,080	16.7	.5998	283	2,586	33.1	3,729	22.8	4	6.67	50	83.4
Mercer	1,354	18,844	35.9	2.7963	484	11,242	60.2	15,237	44.4	8	2.86	248	88.7
Metcalfe	274	9,444	14.5	1.1473	239	4,702	29.1	6,445	21.3	4	3.49	83	72.3
Monroe	515	12,277	21.0	1.3859	372	6,533	39.4	8,377	30.7	11	7.94	115	83.0
Montgomery	1,338	20,077	33.3	2.4866	549	10,117	66.1	14,603	45.8	8	3.28	265	106.8
Morgan	648	12,080	26.8	1.6459	394	5,660	57.2	8,652	37.4	9	5.47	174	105.7
Muhlenberg	2,151	32,234	33.4	4.6426	463	18,473	58.2	24,957	48.1	13	2.80	508	109.4
Nelson	1,937	27,456	35.3	4.1802	463	15,311	63.3	20,579	47.1	14	3.35	432	103.3
Nicholas	170	7,172	11.9	.6533	260	3,397	25.0	5,543	15.3	2	2.35	48	47.0
Ohio	1,025	21,877	23.4	4.1329	248	12,281	41.7	16,924	30.3	16	3.87	285	69.0
Oldham	1,353	27,712	24.4	2.9450	459	11,924	56.7	17,719	38.2	11	3.74	387	134.3
Owen	335	8,713	19.2	1.2216	274	4,576	36.6	6,557	25.5	3	2.46	90	78.7
Owsley	174	5,704	15.3	.5583	312	2,506	34.7	3,153	27.6	5	8.96	49	87.8
Pendleton	531	10,947	24.3	1.2218	435	6,079	43.7	8,170	32.5	4	3.27	132	108.0
Perry	2,411	33,341	36.2	3.7909	636	15,039	80.2	20,477	58.9	27	7.12	545	143.8
Pike	4,249	80,777	26.3	9.9378	428	36,447	58.3	54,083	39.3	28	2.82	1,150	115.7
Powell	540	11,073	24.4	2.0721	261	5,437	49.7	6,786	39.8	8	3.86	152	73.4
Pulaski	2,791	45,697	30.5	6.0557	461	23,927	58.3	39,859	35.0	29	4.79	579	95.6
Robertson	61	2,282	13.4	.3049	200	1,283	23.8	1,854	16.5	1	3.28	20	65.6
Rockcastle	750	13,929	26.9	3.5968	211	7,015	53.5	9,175	40.9	12	3.38	172	48.5
Rowan	1,623	19,026	42.7	2.3917	679	8,145	99.6	11,552	70.2	7	2.93	333	139.2
Russell	390	13,488	14.5	1.7206	227	7,083	27.5	10,465	18.6	9	5.23	95	55.2
Scott	1,880	21,765	43.2	3.4365	538	11,560	81.3	15,893	59.1	9	2.57	390	111.5
Shelby	1,871	27,775	33.7	4.3580	429	12,106	77.3	16,335	51.0	16	3.67	474	108.8
Simpson	1,004	14,627	34.3	2.5502	394	8,550	58.4	11,502	43.6	10	3.92	236	92.5
Spencer	268	5,955	22.5	.8657	310	3,737	35.9	4,863	27.4	6	6.93	109	125.9
Taylor	1,320	20,916	31.6	2.2403	589	11,502	57.4	15,719	42.0	13	5.80	272	121.4
Todd	487	11,640	20.9	1.6045	303	6,184	39.4	9,209	26.4	11	6.86	140	87.3
Trigg	779	9,366	41.6	1.6851	426	5,815	67.0	8,353	46.6	7	3.77	182	108.4
Trimble	221	6,269	17.6	.7707	287	3,700	29.9	4,456	24.8	1	1.30	69	89.5
Union	1,265	17,807	35.5	2.4078	525	10,881	53.1	12,285	51.6	12	4.98	317	131.7
Warren	8,942	70,068	63.8	10.1416	882	37,292	119.9	49,775	89.8	41	4.04	1,683	165.0
Washington	582	10,721	27.1	1.5517	375	6,234	48.5	8,413	34.6	4	2.58	112	72.2
Wayne	859	16,984	25.3	1.7761	484	8,392	51.2	12,491	34.4	5	2.82	180	90.1
Webster	968	14,844	33.3	2.6264	376	8,783	55.2	12,656	38.4	10	3.81	234	89.1
Whitley	2,143	32,697	32.8	6.2750	342	13,958	76.8	28,429	42.1	16	2.55	416	66.3
Wolfe	330	6,712	24.6	1.7378	190	3,212	51.4	4,166	39.6	10	5.75	95	55.2
Woodford	1,451	17,616	41.2	3.3551	432	10,374	69.9	12,576	57.2	9	2.68	270	80.5

county was obtained from the Division of Driver Licensing; the numbers of registered vehicles were obtained from the Bureau of Vehicle Regulation.

Before counties with high accident rates were determined, the counties were grouped by population. This type of analysis was used because average accident rates increase as population increases. The average accident rate (using accidents per 100 million vehicle-miles (MVM) (160 million vehicle-kilometers (MVK)) for each population category was determined, and then a critical rate was calculated using

Table 2. Average and Critical Accident Rates by County Population Category (1978 and 1979 Data).

POPULATION CATEGORY	NUMBER OF COUNTIES IN CATEGORY	TOTAL POPULATION	TOTAL MILEAGE DRIVEN (100 MVM)
UNDER 10,000	25	182,539	30.6469
10,000 - 19,999	47	667,359	96.6414
20,000 - 49,999	36	1,131,342	152.8292
50,000 - 100,000	9	558,303	87.6709
OVER 100,000	3	1,035,584	133.8745

POPULATION CATEGORY	TOTAL ACCIDENTS	ACCIDENTS PER 100 MVM	ANNUAL ACCIDENTS PER 1,000 POPULATION	CRITICAL ACCIDENT RATE (ACC/100 MVM)	NUMBER OF COUNTIES AT OR ABOVE CRITICAL RATE
UNDER 10,000	8,548	279	23.4	318	4
10,000 - 19,999	37,007	383	27.7	418	14
20,000 - 49,999	78,101	511	34.5	539	11
50,000 - 100,000	59,164	675	53.0	696	4
OVER 100,000	116,730	872	56.4	838	1

POPULATION CATEGORY	TOTAL FATAL ACCIDENTS	FATAL ACCIDENTS PER 100 MVM	ANNUAL FATAL ACCIDENTS PER 10,000 POPULATION	CRITICAL FATAL ACCIDENT RATE (ACC/100 MVM)	NUMBER OF COUNTIES AT OR ABOVE CRITICAL RATE
UNDER 10,000	111	3.62	3.04	6.45	1
10,000 - 19,999	399	3.51	2.99	7.12	4
20,000 - 49,999	579	3.79	2.56	6.34	1
50,000 - 100,000	225	2.57	2.02	3.95	1
OVER 100,000	272	2.03	1.31	2.59	0

POPULATION CATEGORY	TOTAL NUMBER OF FATAL AND INJURY ACCIDENTS	FATAL AND INJURY ACCIDENTS PER 100 MVM	ANNUAL FATAL AND INJURY ACCIDENTS PER 1,000 POPULATION	CRITICAL FATAL AND INJURY ACCIDENT RATE (ACC/100 MVM)	NUMBER OF COUNTIES AT OR ABOVE CRITICAL RATE
Under 10,000	2,252	73.5	6.17	93.8	4
10,000 - 19,999	9,017	93.3	6.76	100.8	8
20,000 - 49,999	17,721	115.9	7.83	129.4	8
50,000 - 100,000	11,063	126.2	9.91	135.5	3
Over 100,000	19,999	149.4	9.66	154.1	2

the following formula (4):

$$Ac = Aa + K\,(SQRT(Aa/m)) + 1/(2m)$$

in which Ac = critical rate,
Aa = average rate,
K = constant related to level of statistical significance selected (for P = 0.995, K = 2.576),
SQRT = square root, and
m = annual mileage driven per county.

The average and critical rates by population category are presented in Table 2. These were calculated for total accidents, fatal accidents, and injury-or-fatal accidents. The number of counties with rates above each critical rate is also given. This number is controlled by the level of statistical significance chosen. A high level (P = 0.995) was chosen to limit the number of counties listed. Even at this level, 34 counties were above the critical level for total accidents and 25 were above the critical level for injury-or-fatal accidents only. There were only seven counties with fatal accident rates above critical.

A list of counties with total accident rates above the critical level is given in Table 3. Some of the counties had particularly high rates for their population categories. For the under-10,000 population category, Carroll County had a high rate. Mason and Marion Counties had very high rates for the 10,000-to-19,999 population category. Franklin and Clark Counties had high rates for the 20,000-to-49,999 population category. Campbell County had by far the

Table 3. Counties with Total Accident Rates Above Critical (1978 and 1979 Accidents).

POPULATION CATEGORY	COUNTIES WITH ACCIDENT RATES ABOVE CRITICAL	NUMBER OF ACCIDENTS	ACCIDENT RATE (ACCIDENTS PER 100 MVM)
under 10,000	Carroll	1,061	607
	Trigg	779	420
	Crittenden	508	379
	Elliott	253	335
10,000-19,999	Mason	2,185	872
	Marion	1,340	800
	Rowan	1,623	679
	Harrison	1,084	612
	Bourbon	1,547	590
	Union	1,265	525
	Mercer	1,354	484
	Wayne	859	484
	Anderson	848	456
	Estill	621	455
	Lewis	671	441
	Garrard	678	438
	Pendleton	531	435
	Woodford	1,451	432
20,000-49,999	Franklin	4,118	905
	Clark	2,795	832
	Henderson	4,859	788
	Boone	5,865	731
	Boyle	2,223	676
	Perry	2,411	636
	Taylor	1,320	589
	Calloway	2,080	559
	Jessamine	1,699	558
	Laurel	2,659	549
	Montgomery	1,338	549
50,000-100,000	Campbell	8,688	1,201
	Daviess	9,793	892
	Warren	8,942	882
	Boyd	6,135	734
over 100,000	Kenton	15,996	1,063

highest rate in the 50,000-to-100,000 population category. Campbell County also had the highest accident rate in the state. Kenton County was the only county with a rate above critical in the over-100,000 population category. In general, the same counties were identified in both this report, which used 1978 and 1979 data, and the past report (2), which used 1978 data only. Of the 34 counties identified in this report as having total accident rates above the critical level, 28 were also identified in the previous report. However, there were six new counties identified as critical, and 14 counties listed previously were not identified in this study. The number of counties listed as having rates above critical was reduced from 42 using 1978 data only (2) to 34 using 1978 and 1979 data. As the accident data base increases, the tendency to only identify counties with a long-term accident problem will increase.

Some problem identification reports exclude property-damage-only accidents from their analysis and use only injury-or-fatal accidents. Accident rates using only injury-or-fatal accidents were calculated for each county (Table 1). Critical rates were calculated by population group (Table 2). Counties with injury-or-fatal accident rates above critical are given in Table 4. Counties having high rates for their population categories were identified. For the under-10,000 population category, Carroll and Spencer Counties had high rates. Bourbon and Marion Counties had high rates for the 10,000-to-19,999 population category. Henderson, Franklin, and Clark Counties had the highest rates for the 20,000-to-49,999 population category. Campbell County had the highest rate for the 50,000-to-100,000 population category. As with the total accident rate, Campbell County had the highest injury-or-fatal rate in the state. Kenton County had the highest rate for the over-100,000 population category. Counties with both total and injury-or-fatal accident rates above critical are given in Table 5. Twenty of the 25 counties identified as having injury-or-fatal accident rates

Table 4. Counties with Injury-or-Fatal Accident Rates Above Critical.

POPULATION CATEGORY	COUNTY	NUMBER OF INJURY-OR-FATAL ACCIDENTS	ACCIDENT RATE
under 10,000	Carroll	228	130.4
	Spencer	109	125.9
	Crittenden	141	105.1
	Trigg	192	103.4
10,000-19,999	Bourbon	417	158.9
	Marion	265	158.2
	Mason	358	142.8
	Rowan	333	139.2
	Union	317	131.7
	Lewis	186	122.4
	Magoffin	196	118.9
	Garrard	183	116.3
20,000-49,999	Henderson	1,026	166.3
	Franklin	736	161.7
	Clark	542	161.4
	Calloway	497	155.9
	Boone	1,192	148.5
	Perry	545	143.8
	Oldham	397	134.8
	Meade	369	131.5
50,000-100,000	Campbell	1,426	197.1
	Warren	1,653	163.0
	Daviess	1,659	151.1
over 100,000	Kenton	2,858	190.4
	Fayette	4,575	163.3

Table 5. Counties with Both Total and Injury-or-Fatal Accident Rates Above Critical.

POPULATION CATEGORY	COUNTY	TOTAL ACCIDENT RATES	INJURY-OR-FATAL ACCIDENT RATES
under 10,000	Carroll	607	130.4
	Trigg	420	103.4
	Crittenden	379	105.1
10,000-19,999	Mason	872	142.8
	Marion	800	158.2
	Rowan	679	139.2
	Bourbon	590	158.9
	Union	525	131.7
	Lewis	441	122.4
	Garrard	438	118.3
20,000-49,999	Franklin	905	161.7
	Clark	832	161.4
	Henderson	788	166.3
	Boone	731	148.5
	Perry*	636	143.8
	Calloway	559	155.9
50,000-100,000	Campbell	1,201	197.1
	Daviess	892	151.1
	Warren*	882	163.0
over 100,000	Kenton	1,063	190.4

* These counties also had fatal accident rates above critical.

above critical also had total accident rates above critical. A few counties were identified as having some of the highest rates in their population categories for both total and injury-or-fatal accidents. These counties were Carroll, Marion, Franklin, Clark, Campbell, and Kenton.

A detailed analysis of fatal accidents will follow. However, it should be noted that only two counties had accident rates above critical considering all three classifications of accidents (total, injury-or-fatal, and fatal). These two counties are Perry and Warren, as identified in Table 5.

City Accident Statistics

A similar type of accident analysis was performed for cities using three years of accident data. The cities used in the analysis were those listed in the 1980 census, which meant a city had to be incorporated to be included in the analysis. This seemed to be a reasonable requirement and resulted in a more manageable number of cities compared to that used in the past. The populations listed in preliminary 1980 census data were used. A problem that eliminated a few newly incorporated areas from this analysis was that they were not included in the list of cities coded by the Kentucky State Police. Also, several incorporated cities surrounding Louisville, such as St. Matthews and Shivley, were grouped with Louisville because accidents in these cities had been coded as occurring in Louisville. A total of 348 cities were identified.

A separate, more detailed analysis was made for cities having a population of 1,000 or more; a total of 186 cities were placed into that category. Accident data for the 186 cities are given in Table 6. Accident rates per 1,000 population were calculated; rates per 10,000 population were calculated for fatal accidents, pedestrian accidents, motorcycle accidents, and bicycle accidents. Also, the percentages of accidents involving speeding and alcohol were determined.

As with counties, average and critical rates were determined by city population categories. The results are given in Table 7. Rates were calculated in terms of accidents per 1,000 population since the number of vehicle-miles traveled in each city was not known. In general,

Table 6. Accident Data for Cities with Populations Over 1,000.

CITY	POPULATION	NUMBER OF ACCIDENTS (1977-1979)	ANNUAL ACCIDENTS PER 1,000 POPULATION	NUMBER OF FATAL ACCIDENTS (1977-1979)	ANNUAL FATAL ACCIDENTS PER 10,000 POPULATION	NUMBER OF PEDESTRIAN ACCIDENTS (1977-1979)	ANNUAL PEDESTRIAN ACCIDENTS PER 10,000 POPULATION	NUMBER OF BICYCLE RELATED MOTOR VEHICLE ACCIDENTS (1977-1979)	ANNUAL BICYCLE ACCIDENTS PER 10,000 POPULATION	NUMBER OF MOTORCYCLE MOTOR VEHICLE ACCIDENTS	ANNUAL MOTORCYCLE ACCIDENTS PER 10,000 POPULATION	PERCENT OF ACCIDENTS INVOLVING SPEEDING	PERCENT OF ACCIDENTS INVOLVING ALCOHOL
Louisville	487,916	100,258	68.5	247	1.7	1565	10.7	659	4.7	1153	7.9	06	04
Lexington	203,082	36,023	59.1	78	1.3	502	8.2	229	3.8	405	6.7	05	07
Owensboro	53,839	11,217	69.5	13	0.8	96	6.1	125	7.7	92	5.7	02	05
Covington	46,899	12,500	85.2	12	0.8	283	19.3	83	5.7	103	7.0	04	08
Bowling Green	33,887	10,905	93.5	19	1.6	74	6.3	54	4.6	125	10.7	03	05
Paducah	30,405	6,490	71.1	12	1.3	59	6.7	33	3.6	95	10.4	03	07
Ashland	27,042	6,425	79.2	8	1.0	63	7.8	25	3.1	52	6.4	03	03
Hopkinsville	27,125	5,300	65.1	13	1.6	59	7.3	24	3.0	46	5.6	05	05
Frankfort	25,922	4,488	57.7	4	0.5	57	7.3	19	2.4	43	5.5	03	04
Henderson	24,778	5,379	72.4	18	2.4	90	12.1	41	5.5	55	7.4	02	05
Richmond	21,694	4,276	65.7	8	1.2	46	7.1	17	2.6	35	5.4	03	05
Newport	21,275	5,527	86.6	5	0.8	182	28.5	47	7.4	56	8.8	02	04
Madisonville	16,945	2,886	56.8	4	0.8	21	4.1	20	3.9	47	9.2	03	04
Fort Thomas	15,924	1,707	35.7	2	0.4	16	3.4	19	4.0	17	3.6	06	06
Florence	15,561	4,717	101.0	7	1.5	43	9.2	19	4.1	46	9.8	04	04
Elizabethtown	15,351	2,656	57.7	8	1.7	27	5.9	12	2.6	48	10.4	05	04
Winchester	15,212	2,742	60.1	4	0.9	31	6.8	6	1.3	19	4.2	02	05
Radcliff	14,483	2,025	46.6	6	1.4	24	5.5	11	2.5	55	12.7	07	06
Erlanger	14,452	3,351	77.3	2	0.5	34	7.8	19	4.4	22	5.1	04	06
Murray	14,223	2,221	52.1	5	1.2	15	3.5	5	1.2	29	6.8	03	04
Glasgow	12,961	2,167	55.7	5	1.3	20	5.1	10	2.6	19	4.9	02	03
Danville	12,923	2,084	53.8	4	1.3	27	7.0	16	4.1	15	3.9	01	02
Middlesboro	12,055	1,352	37.4	5	1.4	25	6.9	10	2.8	7	1.9	02	05
Georgetown	10,954	1,453	44.2	1	0.3	11	3.4	10	3.0	9	2.7	04	04
Mayfield	10,745	2,138	66.3	1	0.3	15	4.7	12	3.7	19	5.9	01	02
Somerset	10,649	2,329	72.9	9	2.8	27	5.6	6	1.9	19	5.9	04	02
Nicholasville	9,802	1,306	44.4	0	0.0	9	3.1	2	0.7	15	5.1	02	08
Campbellsville	8,663	1,380	53.1	5	1.9	11	4.2	4	1.5	16	6.2	03	02
Berea	8,240	858	34.7	2	0.8	4	1.6	8	3.2	5	2.0	03	03
Flatwoods	8,139	866	35.5	2	0.8	8	3.3	2	0.8	11	4.5	02	03
Corbin	7,988	1,485	62.0	2	0.8	13	5.4	4	1.6	19	7.9	02	03
Independence	7,986	906	37.8	4	1.7	10	4.2	8	3.3	9	3.8	13	06
Paris	7,901	1,059	44.7	3	1.3	17	7.2	7	3.0	7	2.9	04	07
Maysville	7,879	2,215	93.7	1	0.4	12	5.1	8	3.4	13	5.5	01	04
Morehead	7,773	1,430	61.3	1	0.4	12	5.2	5	2.1	7	3.0	03	04
Franklin	7,735	908	39.1	2	0.9	6	2.6	0	0.0	9	3.9	02	04
Bellevue	7,664	1,329	57.8	1	0.4	26	11.2	15	7.7	7	3.0	02	04
Russellville	7,502	1,211	53.8	3	1.3	17	7.6	4	1.6	12	5.3	04	06
Edgewood	7,262	744	34.2	1	0.5	9	4.1	11	5.1	9	4.1	04	05
Harrodsburg	7,251	1,285	59.1	5	2.3	16	7.4	6	2.8	15	6.9	02	04
Elsmere	7,164	766	35.6	2	0.9	20	9.3	4	1.9	14	6.5	04	05
Fort Mitchell	7,147	1,114	52.0	1	0.5	10	4.7	11	5.1	11	5.1	07	06
Princeton	7,067	1,119	52.8	4	1.9	14	6.6	3	1.4	12	5.7	04	04
Dayton	6,934	653	31.4	1	0.5	22	10.6	6	3.4	6	2.9	03	08
Lebanon	6,494	1,077	55.3	1	0.5	9	4.6	4	2.1	5	2.6	03	07
Versailles	6,202	1,082	58.2	3	1.6	11	5.9	3	1.6	8	4.3	03	04
Bardstown	6,142	1,333	72.3	0	0.0	14	7.6	8	4.3	11	6.0	02	05
Cynthiana	5,869	868	49.3	1	0.6	19	10.6	4	2.3	11	6.2	04	04
Mount Sterling	5,809	1,275	73.2	2	1.2	18	10.3	3	1.7	4	2.3	03	05
Monticello	5,667	799	47.0	1	0.6	6	3.5	4	2.4	3	1.8	05	05
Williamsburg	5,459	680	41.5	3	1.6	8	4.9	1	0.6	15	8.5	06	03
Hazard	5,382	1,400	86.6	2	1.2	9	5.6	3	1.9	14	8.6	03	05
Shelbyville	5,323	1,181	74.0	1	0.6	10	6.3	7	4.4	12	7.5	02	04
Central City	5,219	926	59.3	3	1.9	8	5.1	2	1.3	5	3.2	03	04
Lawrenceburg	5,168	632	40.8	3	1.9	12	7.7	4	2.6	8	5.2	02	04
Ludlow	4,940	594	40.1	1	0.7	17	11.5	7	4.7	0	0.0	06	08
Alexandria	4,718	569	40.2	1	0.7	5	3.5	1	0.7	6	4.2	05	03
Pikeville	4,751	1,487	104.3	3	2.1	15	10.5	5	3.5	7	4.9	02	03
Greenville	4,636	592	42.6	2	1.4	2	1.4	4	2.9	6	4.3	08	02
Leitchfield	4,450	929	69.6	2	1.5	12	9.0	4	3.0	4	3.0	05	03
Shepherdsville	4,428	1,053	79.3	2	1.5	7	5.3	4	3.0	12	9.0	06	06
Highland Heights	4,428	538	40.5	1	0.8	5	3.8	1	0.8	5	3.8	01	02
Providence	4,425	556	41.9	5	3.8	8	6.0	1	0.8	10	7.5	01	02
Taylor Mill	4,414	395	29.8	3	2.3	4	3.0	0	0.0	7	5.3	09	05
Villa Hills	4,407	102	7.7	0	0.0	0	0.0	1	0.8	0	0.0	06	06
Tompkinsville	4,335	331	25.5	3	2.3	3	2.3	0	0.0	4	3.1	09	05
Scottsville	4,239	379	29.8	4	3.2	5	4.0	0	0.0	5	3.9	15	05
Fort Wright	4,205	1,005	79.7	1	0.8	8	6.3	4	3.2	12	9.5	04	06
Mount Washington	3,984	260	23.4	3	2.5	3	2.5	1	0.8	2	1.7	04	04
London	3,973	1,210	101.5	3	2.5	16	13.4	2	1.7	14	11.7	02	03
Carrollton	3,952	717	60.5	3	2.5	5	4.2	7	5.9	7	5.9	01	05
Prestonsburg	3,938	910	77.0	2	1.7	4	3.4	3	2.5	5	4.2	04	04
Russell	3,861	907	78.3	2	1.7	4	3.5	1	0.9	8	6.9	02	03
Paintsville	3,802	1,135	99.5	3	2.6	5	4.4	1	0.9	9	7.9	03	03
Nilmore	3,790	86	7.6	0	0.0	0	0.0	0	0.0	0	0.0	03	03
Morsanfield	3,769	622	35.0	1	0.9	7	6.2	6	5.3	6	5.3	06	05
Columbia	3,704	544	49.0	0	0.0	3	2.7	1	0.9	3	2.7	05	05
Cumberland	3,700	210	18.9	2	1.8	1	0.9	0	0.0	3	2.7	11	09
Benton	3,684	577	52.2	0	0.0	4	3.6	0	0.0	3	2.7	01	02
Vine Grove	3,586	227	21.1	0	0.0	3	2.8	1	0.9	7	6.5	07	08
Park Hills	3,462	413	39.8	1	1.0	4	3.9	2	1.9	2	1.9	03	04
Grayson	3,417	573	55.9	3	2.9	6	5.9	0	0.0	3	2.9	05	05
Marion	3,402	442	43.3	1	1.0	4	3.9	1	1.0	18	17.6	04	03
Lancaster	3,353	390	38.7	2	2.0	5	5.0	2	2.0	5	5.0	03	03
Barbourville	3,299	558	56.4	1	1.0	8	8.1	1	1.0	4	4.0	04	03
Dawson Springs	3,264	399	40.8	0	0.0	8	8.2	1	1.0	3	3.1	03	04
Jenkins	3,249	45	4.6	2	2.1	3	3.1	0	0.0	0	0.0	35	11
Beaver Dam	3,173	453	47.6	0	0.0	2	2.1	0	0.0	5	5.2	02	04
Springfield	3,169	432	45.4	2	2.1	7	7.4	1	1.1	3	3.2	02	03
Fulton	3,141	313	33.2	1	1.1	3	3.2	3	3.2	4	4.2	03	06
Williamstown	3,123	261	27.9	1	1.1	2	2.1	2	2.1	0	0.0	17	05
Lakeside Park	3,079	294	31.8	0	0.0	0	0.0	1	1.1	4	4.3	05	06
Harlan	3,021	731	80.7	2	2.2	12	13.2	3	3.3	3	3.3	04	05
Catlettsburg	2,982	628	70.2	0	0.0	3	3.4	4	4.5	3	3.3	04	05
Hickman	2,900	222	25.5	0	0.0	1	1.2	0	0.0	2	2.3	03	08
Irvine	2,865	436	50.4	1	1.2	4	4.6	0	0.0	4	4.6	08	01
Flemingsburg	2,826	359	43.5	0	0.0	1	1.2	1	1.2	4	4.7	05	02
Southgate	2,780	475	57.0	0	0.0	3	3.6	3	3.6	6	7.2	05	08
Stanford	2,776	403	48.4	2	2.4	0	0.0	3	3.6	4	4.8	02	04
LaGrange	2,720	323	39.6	1	1.2	3	3.7	2	2.5	1	1.2	03	05
Stanton	2,685	204	25.3	0	0.0	2	2.5	0	0.0	4	5.0	03	07
Jackson	2,650	135	17.0	0	0.0	3	3.8	1	1.3	1	1.3	07	05
Hartford	2,631	92	11.7	1	1.3	0	0.0	0	0.0	2	2.5	09	03
Pineville	2,585	431	55.6	2	2.6	6	7.7	2	2.6	6	7.7	04	04
Olive Hill	2,513	241	32.0	0	0.0	2	2.7	0	0.0	4	5.3	07	06
Hodgenville	2,487	350	46.9	2	2.7	6	8.0	3	4.0	4	5.4	05	03
Falmouth	2,466	229	31.0	2	2.7	2	2.7	0	0.0	2	2.7	05	08
Calvert City	2,402	182	25.3	2	2.8	2	2.8	1	1.4	1	1.4	09	10
Greensburg	2,354	365	51.7	0	0.0	2	2.6	1	1.4	4	5.7	02	01
Mount Vernon	2,323	278	39.9	0	0.0	2	2.9	1	1.4	0	0.0	02	03
Sturgis	2,284	277	40.4	0	0.0	2	2.9	2	2.9	4	5.8	01	04
Eminence	2,259	125	18.4	1	1.5	4	5.9	0	0.0	1	1.5	06	05
Hardinsburg	2,219	429	64.4	2	3.0	4	6.0	0	0.0	4	6.0	03	03
Liberty	2,196	219	33.2	2	3.0	0	0.0	0	0.0	2	3.0	05	03
Cold Springs	2,130	318	49.8	0	0.0	1	1.6	6	9.4	3	4.7	03	01
Oak Grove	2,086	434	69.4	1	1.6	3	4.8	3	4.8	5	8.0	09	03
Junction City	2,040	180	29.4	0	0.0	2	3.3	2	3.3	0	0.0	08	07
Burkesville	2,039	200	32.7	0	0.0	2	3.3	0	0.0	0	0.0	05	03
Earlington	2,020	69	11.4	0	0.0	1	1.7	0	0.0	0	0.0	13	04
Horse Cave	2,019	87	14.4	0	0.0	0	0.0	0	0.0	1	1.6	06	08
Albany	2,009	254	42.1	0	0.0	1	1.7	0	0.0	3	5.0	03	05
Cave City	1,997	279	46.6	1	1.7	3	5.0	0	0.0	6	10.0	01	03
Worthington	1,947	75	12.8	1	1.7	2	3.4	0	0.0	2	3.4	08	09
Eddyville	1,945	116	19.9	1	1.7	0	0.0	1	1.7	2	3.4	08	08
Vanceburg	1,922	192	33.3	1	1.7	2	3.5	2	3.5	0	0.0	11	08
Raceland	1,919	144	25.0	0	0.0	0	0.0	0	0.0	1	1.7	06	06
Brandenburg	1,845	342	61.8	4	7.2	3	5.4	0	0.0	6	10.8	03	04
Louisa	1,838	411	74.5	0	0.0	3	5.4	1	1.8	2	3.6	04	03
Manchester	1,829	312	56.9	0	0.0	2	3.6	0	0.0	2	3.6	03	02
Lewisport	1,824	45	8.2	1	1.8	0	0.0	0	0.0	0	0.0	18	07

Table 6. Accident Data for Cities with Populations Over 1,000. *(Continued)*

CITY	POPULATION	NUMBER OF ACCIDENTS (1977-1979)	ANNUAL ACCIDENTS PER 1,000 POPULATION	NUMBER OF FATAL ACCIDENTS (1977-1979)	ANNUAL FATAL ACCIDENTS PER 10,000 POPULATION	NUMBER OF PEDESTRIAN ACCIDENTS (1977-1979)	ANNUAL PEDESTRIAN ACCIDENTS PER 10,000 POPULATION	NUMBER OF BICYCLE RELATED MOTOR VEHICLE ACCIDENTS (1977-1979)	ANNUAL BICYCLE ACCIDENTS PER 10,000 POPULATION	NUMBER OF MOTORCYCLE MOTOR VEHICLE ACCIDENTS	ANNUAL MOTORCYCLE ACCIDENTS PER 10,000 POPULATION	PERCENT OF ACCIDENTS INVOLVING SPEEDING	PERCENT OF ACCIDENTS INVOLVING ALCOHOL
Elkton	1,821	227	41.6	2	3.7	1	1.8	1	1.8	1	1.8	01	03
Russell Springs	1,821	181	33.1	0	0.0	1	1.8	0	0.0	1	1.8	02	01
Munfordville	1,788	226	42.1	1	1.9	1	1.9	1	1.9	0	0.0	10	08
Morgantown	1,781	143	26.8	2	3.7	3	5.6	0	0.0	0	0.0	04	06
Carlisle	1,761	61	11.6	0	0.0	0	0.0	0	0.0	0	0.0	03	02
Muldraugh	1,755	355	67.6	3	5.7	4	7.6	1	1.9	6	11.4	09	13
Clinton	1,724	170	32.9	2	3.9	4	7.7	0	0.0	1	1.9	05	04
Livermore	1,683	52	10.3	0	0.0	0	0.0	1	2.0	1	2.0	06	06
Cadiz	1,654	474	95.5	2	4.0	7	14.1	1	2 0	3	6.0	03	02
Walton	1,650	333	67.3	0	0.0	4	8.1	1	2.0	3	6.1	11	03
Lynch	1,609	1	2.7	0	0.0	0	0.0	0	0.0	0	0.0	08	00
Cresent Springs	1,605	651	135.2	0	0.0	3	6.2	0	0.0	2	4.1	04	04
Lebanon Junction	1,565	98	20.9	3	6.4	1	2.1	0	0.0	2	4.3	15	10
South Shore	1,534	80	17.4	1	2.2	2	4.4	0	0.0	1	2.2	08	05
Jeffersonville	1,532	74	16.1	0	0.0	0	0.0	0	0.0	0	0.0	15	12
Sebree	1,502	103	22.9	0	0.0	1	2.2	0	0.0	2	4.4	11	08
Whitesburg	1,493	220	49.1	1	2.2	7	15.6	0	0.0	1	2.2	04	03
Auburn	1,464	42	9.6	0	0.0	1	2.3	2	4.6	0	0.0	05	07
Cloverport	1,457	93	21.3	0	0.0	2	4.6	0	0.0	0	0.0	13	05
Augusta	1,455	87	19.9	1	2.3	1	2.3	1	2.3	0	0.0	06	14
Midway	1,435	71	16.5	0	0.0	2	4.7	0	0.0	0	0.0	03	08
Elkhorn City	1,426	69	16.1	0	0.0	2	4.7	1	2.3	0	0.0	03	06
Jamestown	1,419	27	6.3	0	0.0	0	0.0	0	0.0	2	4.7	11	07
Owingsville	1,414	147	34.7	0	0.0	3	7.1	0	0.0	1	2.4	03	03
Irvington	1,405	71	16.8	0	0.0	1	2.4	0	0.0	3	7.1	06	08
Edmonton	1,401	99	23.6	0	0.0	0	0.0	0	0.0	0	0.0	08	08
Loyall	1,207	56	15.5	0	0.0	1	2.8	1	2.8	1	2.8	07	07
Crestview Hill	1,394	185	44.2	0	0.0	1	2.4	0	0.0	2	4.8	03	05
West Liberty	1,388	212	50.9	1	2.4	2	4.8	1	2.4	4	9.6	08	05
Gresnup	1,378	199	48.1	2	4.8	2	4.8	2	4.8	5	12.1	05	24
Owenton	1,372	124	30.1	0	0.0	1	2.4	0	0.0	0	0.0	10	02
Clay	1,351	115	28.4	0	0.0	0	0.0	0	0.0	1	2.5	07	05
Guthrie	1,339	12	3.0	0	0.0	2	5.0	0	0.0	0	0.0	33	00
Nortonville	1,333	53	13.3	0	0.0	0	0.0	0	0.0	1	2.5	13	09
Saiversville	1,331	196	49.1	0	0.0	5	12.5	0	0.0	5	12.5	17	08
West Point	1,326	172	43.2	1	2.5	3	7.5	1	2.5	2	5.0	16	10
Warsaw	1,304	120	30.7	0	0.0	1	2.6	2	5.1	0	0.0	01	04
Hurtland	1,288	80	20.7	0	0.0	1	2.6	1	2.6	1	2.6	03	09
Camargo	1,284	13	3.4	0	0.0	0	0.0	0	0.0	0	0.0	23	00
Clay City	1,274	114	29.8	1	2.6	6	15.7	1	2.6	0	0.0	09	08
Silver Grove	1,260	145	38.4	0	0.0	2	5.3	0	0.0	2	5.3	07	10
Dry Ridge	1,254	283	75.2	1	2.7	1	2.7	0	0.0	1	2.7	14	06
Evarts	1,231	100	27.1	1	2.7	6	16.3	0	0.0	2	5.4	18	10
Mortons Gap	1,189	44	12.3	0	0.0	1	2.8	0	0.0	1	2.8	18	05
Uniontown	1,182	40	11.3	0	0.0	1	2.8	2	5.6	0	0.0	05	13
Fleming-Neon	1,145	11	3.2	0	0.0	0	0.0	0	0.0	0	0.0	09	09
Phelps	1,120	71	21.1	0	0.0	0	0.0	0	0.0	1	3.0	10	04
Adairville	1,096	58	17.6	0	0.0	0	0.0	0	0.0	0	0.0	07	12
Calhoun	1,082	97	29.9	0	0.0	0	0.0	0	0.0	2	6.2	04	02
Beattyville	1,058	131	41.3	1	3.2	3	9.5	0	0.0	0	0.0	10	03
Hickliffe	1,045	123	39.2	0	0.0	0	0.0	0	0.0	0	0.0	07	06
Barbourmeade	1,036	2	0.6	0	0.0	0	0.0	0	0.0	0	0.0	00	00
LaCenter	1,036	89	28.6	0	0.0	0	0.0	0	0.0	0	0.0	06	02
Hawesville	1,029	154	49.9	0	0.0	1	3.2	0	0.0	1	3.2	05	04
Ferguson	1,016	29	9.5	0	0.0	0	0.0	0	0.0	0	0.0	10	03
Burgin	1,003	74	24.6	1	3.3	0	0.0	0	0.0	0	0.0	03	04

the average accident rate increased as the city population increased. Critical rates were calculated as for counties, except populations were used instead of mileages. A total of 11 population categories were used. Rates were calculated considering both total and fatal accidents. However, fatal-accident statistics were only calculated for cities with populations of 1,000 or above.

A list of cities with accident rates above critical is given in Table 8. A total of 64 cities were identified; 48 cities with populations of 1,000 or more were identified. The following cities had the highest rates in their population ranges; Louisville, Bowling Green, Newport, Florence, Maysville, Pikeville, Crescent Springs, Hindman, Wilder, Allen, and Fairview. Other cities with particularly high rates for their population categories were Hazard, London, Cadiz, and Crestwood. Populations, numbers of accidents, and accident rates (accidents per 1,000 population) are given in Table 9 for all 348 cities. For cities having a population of 1,000 or more, Crescent Springs, Pikeville, London, and Florence had the highest accident rates. Many of the same cities were identified as having rates above critical using 1977-1979 accident data as were previously identified using 1977-1978 data. Since the 1980 census became available, different population figures were used, which significantly changed a few rates.

Table 7. Average and Critical Accident Rates by City Population Category.

POPULATION CATEGORY	NUMBER OF CITIES IN CATEGORY	TOTAL POPULATION	AVERAGE POPULATION PER CITY	TOTAL ACCIDENTS (1977 - 1979)	ANNUAL AVERAGE ACCIDENTS PER CITY	ANNUAL ACCIDENTS PER 1,000 POP.	CRITICAL ACCIDENT RATE (ACCIDENTS PER 1,000 POPULATION)	NUMBER OF CITIES AT OR ABOVE CRITICAL RATE	TOTAL FATAL ACCIDENTS (1977 - 1979)	ANNUAL AVERAGE FATAL ACCIDENTS PER CITY	ANNUAL FATAL ACCIDENTS PER 1,000 POP.	CRITICAL FATAL ACCIDENT RATE (FATAL ACCIDENTS PER 1,000 POP.)	NUMBER OF CITIES AT OR ABOVE CRITICAL RATE
Under 250	25	4,702	188	321	4.8	22.8	53.9	1	*	*	*	*	*
250 - 499	59	22,019	373	1,240	7.0	18.8	38.4	6	*	*	*	*	*
500 - 749	43	26,175	609	2,196	17.0	28.0	46.3	5	*	*	*	*	*
750 - 999	35	29,647	853	2,109	20.1	23.6	38.9	4	*	*	*	*	*
1,000 - 2,499	81	129,906	1,604	13,182	54.3	33.8	45.9	19	46	0.2	0.12	0.382	0
2,500 - 4,999	50	179,215	3,584	25,218	168.1	46.9	56.4	13	70	0.5	0.13	0.373	0
5,000 - 9,999	29	202,839	6,994	31,887	366.5	52.4	59.5	7	80	0.7	0.10	0.268	0
10,000 - 19,999	14	192,436	13,745	33,823	805.4	58.6	64.0	4	63	1.5	0.11	0.193	0
20,000 - 29,999	6	147,839	24,640	31,395	1,744.2	70.8	75.2	2	56	3.1	0.13	0.258	0
30,000 - 100,000	4	172,033	43,008	41,112	3,426.0	79.7	83.2	2	56	4.5	0.11	0.265	0
Over 100,000	2	690,998	345,499	136,281	22,713.5	65.7	66.8	1	325	54.2	0.16	0.157	0

* Fatal accident statistics were only calculated for cities with populations of 1,000 or above.

Table 8. Cities with Accident Rates Above Critical.

POPULATION CATEGORY	CITIES WITH ACCIDENT RATES AT OR ABOVE CRITICAL	NUMBER OF ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (ACCIDENTS PER 1000 POPULATION)
over 100,000	Louisville	100,258	68.5
30,000-100,000	Bowling Green	10,905	93.5
	Covington	12,500	85.2
20,000-29,999	Newport	5,527	86.6
	Ashland	6,425	79.2
10,000-19,999	Florence	4,717	101.0
	Erlanger	3,351	77.3
	Somerset	2,329	72.9
	Mayfield	2,133	66.3
5,000-9,999	Maysville	2,215	93.7
	Hazard	1,400	85.6
	Shelbyville	1,181	79.0
	Mount Sterling	1,275	73.2
	Bardstown	1,333	72.3
	Corbin	1,485	62.9
	Morehead	1,480	61.3
2,500-4,999	Pikeville	1,487	104.3
	London	3,973	101.5
	Paintsville	1,135	99.5
	Harlan	731	80.7
	Fort Wright	1,005	79.7
	Shepardsville	1,053	79.3
	Russell	907	78.3
	Prestonsburg	910	77.0
	Catlettsburg	628	70.2
	Leitchfield	929	69.6
	Carrollton	3,952	60.5
	Southgate	475	57.0
	Barbourville	558	56.4
1,000-2,499	Crescent Springs	651	135.2
	Cadiz	474	95.5
	Dry Ridge	283	75.2
	Louisa	411	74.5
	Oak Grove	434	69.4
	Muldraugh	356	67.6
	Walton	333	67.3
	Hardinsburg	429	64.4
	Brandenburg	342	61.3
	Manchester	312	56.9
	Greensburg	365	51.7
	West Liberty	212	50.9
	Havesville	154	49.9
	Cold Springs	318	49.8
	Whitesburg	220	49.1
	Salyersville	193	49.1
	Greenup	199	48.1
	Hodgenville	350	46.9
	Cave City	279	46.6
750-999	Hindman	141	53.8
	Westwood	137	51.8
	Mc Kee	106	47.1
	Martin	106	42.6
500-749	Wilder	407	212.0
	Crestwood	184	116.4
	Brownsville	120	59.4
	Crittenden	105	59.4
	Sandy Hook	107	58.2
250-499	Allen	126	129.2
	Campton	133	67.8
	Sonora	74	59.9
	Corinth	57	46.0
	Hyden	66	46.9
	Crescent Park	44	41.8
under 250	Fairview	40	69.8

Table 9. Accidents and Accident Rates for all Cities.

CITY	POPULATION	NUMBER OF ACCIDENTS (77-79)	ANNUAL ACCIDENTS PER 1000 POPULATION
Adairville	1096	58	17.6
Albany	2009	254	42.1
Alexandria	4718	569	40.2
Allen	325	126	129.2
Allensville	169	11	21.7
Arlington	501	24	16.0
Ashland	27042	6425	79.2
Auburn	1464	42	9.6
Augusta	1455	87	19.9
Bancroft	756	3	1.3
Barbourmeade	1036	2	0.6
Barbourville	3299	558	56.4
Bardstown	6142	1333	72.3
Bardwell	989	82	27.6
Barlow	743	33	14.8
Beattyville	1058	131	41.3
Beaver Dam	3173	453	47.6
Bedford	833	41	16.4
Bellefonte	912	42	15.4
Bellevue	7664	1329	57.8
Bellewood	309	0	0.0
Benham	939	51	18.1
Benton	3684	577	52.2
Berea	8240	858	34.7
Berry	285	17	19.9
Blaine	367	12	10.9
Bloomfield	951	93	32.6
Blue Ridge Manor	470	0	0.0
Bonnieville	357	28	26.1
Booneville	196	81	137.8
Bowling Green	38887	10905	93.5
Bradfordville	329	20	20.3
Brandenburg	1845	342	61.8
Bremen	179	22	41.0
Briarwood	377	0	0.0
Broad Fields	282	0	0.0
Brodhead	695	29	13.9
Bromley	818	48	19.6
Brooksville	679	17	8.4
Brownsboro Fm	785	0	0.0
Brownsboro Vil	410	0	0.0
Brownsville	673	120	59.4
Burgin	1003	74	24.6
Burkesville	2039	200	32.7
Burnside	775	85	36.6
Butler	659	21	10.6
Cadiz	1654	474	95.5
Calhoun	1082	97	29.9
California	135	-	---
Calvert City	2402	182	25.3
Camargo	1284	13	3.4
Campbellsburg	711	58	27.2
Campbellsville	8663	1380	53.1
Campton	486	128	87.8
Caneyville	640	68	35.4
Carlisle	1761	61	11.6
Carrollton	3952	717	60.5
Carrsville	99	4	13.5
Caseyville	43	-	---
Catlettsburg	2982	628	70.2
Cave City	1997	279	46.6
Cedarville	82	0	0.0
Centertown	464	30	21.6
Central City	5219	928	59.3
Clarkson	658	41	20.8
Clay	1351	115	28.4
Clay City	1274	114	29.8
Clinton	1724	170	32.9
Cloverport	1457	93	21.3
Coal Run	344	10	9.7
Cold Springs	2130	318	49.8
Columbia	3704	544	49.0
Columbus	291	7	8.0
Corbin	7988	1485	62.0
Corinth	257	37	48.0
Corydon	879	51	19.3
Covington	48899	12500	85.2
Crab Orchard	800	29	12.1
Crescent Park	351	44	41.8
Crescent Spr	1605	651	135.2
Crestview	531	23	14.4
Crestview Hls	1394	185	44.2
Crestwood	527	184	116.4
Crittenden	594	106	59.4
Crofton	817	90	36.7
Cumberland	3700	210	18.9
Cynthiana	5869	868	49.3
Danville	12923	2084	53.8
Dawson Springs	3264	399	40.8
Dayton	6934	653	31.4
Dixon	524	69	43.9
Dover	303	15	16.5
Drakesboro	802	48	20.0
Dry Ridge	1254	283	75.2
Dycusburg	64	-	---
Earlington	2020	69	11.4
Eddyville	1946	116	19.9
Edgewood	7262	744	34.2
Edmonton	1401	99	23.6
Ekron	237	13	18.3
Elizabethtown	15351	2656	57.7
Elkhorn City	1426	69	16.1
Elkton	1821	227	41.6
Elsmere	7164	766	35.6
Eminence	2259	125	18.4
Erlanger	14452	3351	77.3
Eubank	213	12	18.8
Evarts	1231	100	27.1
Fairfield	169	9	17.8
Fairmeade	272	0	0.0
Fairview	191	40	69.8
Falmouth	2466	229	31.0
Ferguson	1016	29	9.5
Flat Wood	8139	866	35.5
Flemingsburg	2826	369	43.5
Fleming-Neon	1146	11	3.2
Florence	15551	4717	101.0
Fordsville	559	20	11.9
Forest Hills	502	7	4.7
Fort Mitchell	7147	1114	52.0
Fort Thomas	15924	1707	35.7
Fort Wright	4205	1005	79.7
Foster	80	-	---
Fountain Run	339	6	5.9
Frankfort	25922	4488	57.7
Franklin	7733	906	39.1
Fredonia	536	29	18.0
Frenchburg	553	48	28.9
Fulton	3141	313	33.2
Gamaliel	456	17	12.4
Georgetown	10954	1453	44.2
Germantown	347	6	5.8
Ghent	438	31	23.6
Glasgow	12961	2167	55.7
Glencoe	355	10	9.4
Glenview Manor	211	0	0.0
Goose Creek	395	1	0.8
Grand Rivers	434	32	24.6
Gratz	126	5	13.2
Grayson	3417	573	55.9
Greensburg	2354	365	51.7
Greenup	1378	199	48.1
Greenville	4636	592	42.6
Guthrie	1339	12	3.0
Hanson	485	34	23.4
Hardin	546	43	26.3
Hardinsburg	2219	429	64.4
Harlan	3021	731	80.7
Harrodsburg	7251	1285	59.1
Hartford	2631	92	11.7
Hawesville	1029	154	49.9
Hazard	5392	1400	86.6
Hazel	462	29	20.9
Henderson	24778	5379	72.4
Hickman	2900	222	25.5
Highland Hts	4428	538	40.5
Hindman	874	141	53.8
Hillview	5194	-	---
Hiseville	342	24	23.4
Hodgenville	2487	350	46.9
Hollyvilla	472	0	0.0
Hopkinsville	27125	5300	65.1
Horse Cave	2019	87	14.4
Houstin Acres	610	2	1.1
Hunters Hollow	0	-	---
Hustonville	336	31	30.8
Hyden	483	68	46.9
Independence	7986	906	37.8
Irvine	2885	436	50.4
Irvington	1405	71	16.8
Island	535	27	16.8
Jackson	2650	135	17.0
Jamestown	1419	27	6.3
Jeffersonville	1532	74	16.1
Jenkins	3249	45	4.6
Junction City	2040	180	29.4
Kenton Vale	147	6	13.6
Kevil	380	26	22.8
Kingsley	466	0	0.0
Kuttawa	560	28	16.7
LaCenter	1036	89	28.6
LaFayette	161	5	10.4
LaGrange	2720	323	39.6
Lakeside Park	3079	294	31.8
Lakeview Hgts.	271	-	---
Lancaster	3363	390	38.7
Latonia Lakes	393	36	30.5
Lawrenceburg	5168	632	40.8
Lebanon	6494	1077	55.3
Lebanon Junc	1565	98	20.9
Leitchfield	4450	929	69.6
Lewisburg	968	70	24.1
Lewisport	1824	95	8.2
Lexington	203082	36023	59.1
Liberty	2196	219	33.2
Livermore	1683	52	10.3
Livingston	332	5	5.0
Lockport	84	3	11.9
London	3973	1210	101.5
Loretto	930	68	24.4
Louisa	1838	411	74.5
Louisville	487916	100258	68.5
Loyall	1207	56	15.5
Ludlow	4940	594	40.1
Lynch	1609	13	2.7
McHenry	588	35	19.8
McKee	751	106	47.1
Mackville	225	10	14.8
Madisonville	16945	2886	56.8
Manchester	1829	312	56.9
Marion	3402	442	43.3
Martin	829	106	42.6
Mary Hill Ests	225	0	0.0
Mayfield	10745	2138	66.3
Maysville	7879	2215	93.7
Melbourne	625	38	20.3
Mentor	168	10	19.8
Middlesboro	12055	1352	37.4
Midway	1435	71	16.5
Millersburg	986	30	10.1
Milton	711	88	41.3
Monterey	174	7	13.4
Monticello	5667	799	47.0
Moorland	518	19	12.2
Morehead	7773	1430	61.3
Morganfield	3769	622	35.0
Morgantown	1781	143	26.8
Mortons Gap	1189	44	12.3
Mount Olivet	345	31	30.0
Mt Sterling	5809	1275	73.2
Mount Vernon	2323	278	39.9
Mt Washington	3984	280	23.4
Muldraugh	1755	356	67.6
Munfordville	1788	226	42.1
Murray	14223	2221	52.1
Nebo	273	14	17.1
New Castle	833	42	16.8
New Haven	912	87	31.8
Newport	21278	5527	86.6
Nicholasville	9802	1306	44.4
N Middletown	637	17	8.9
Northfield	900	1	0.4
Nortonville	1333	53	13.3
Oak Grove	2086	434	69.4
Oakland	259	3	3.9
Olive Hill	2513	241	32.0
Orchard Grass	1047	-	---
Owensboro	53839	11217	69.5

Table 9. Accidents and Accident Rates for all Cities *(Continued)*.

CITY	POPULATION	NUMBER OF ACCIDENTS (77-79)	ANNUAL ACCIDENTS PER 1000 POPULATION
Owenton	1372	124	30.1
Owingsville	1414	147	34.7
Paducah	30408	6490	71.1
Paintsville	3802	1135	99.5
Paris	7901	1095	44.7
Park City	603	35	19.4
Park Hills	3462	413	39.8
Pembroke	638	9	4.7
Perryville	846	53	20.9
Pewee Valley	979	104	35.4
Phelps	1120	71	21.1
Pikeville	4751	1487	104.3
Pineville	2586	431	55.6
Pleasant Val	318	2	2.1
Pleasureville	837	35	13.9
Plum Springs	393	1	0.9
Powderly	847	52	20.5
Prestonburg	3938	910	77.0
Prestonville	203	9	14.8
Princeton	7067	1119	52.8
Providence	4425	556	41 9
Raceland	1919	144	25.0
Radcliff	14483	2025	46.6
Ravenna	790	29	12.2
Richmond	21694	4276	65.7
Ridgeview Hts	728	23	10.5
Riverwood	429	1	0.6
Rochester	283	3	3.5
Rockport	514	18	11.7
Russell	3861	907	78.3
Russell Sprgs	1821	181	35.1
Russellville	7502	1211	53.8
Ryland Hgts	251	-	---
Sacramento	533	42	26.3
Sadieville	253	5	6.6
St Charles	404	21	17.3
Salem	818	61	24.9
Salt Lick	341	24	23.5
Salyersville	1331	196	49.1
Sanders	336	13	12.9
Sandy Hook	607	107	58.8
Sardis	203	9	14.8
Science Hill	657	32	16.2
Scottsville	4239	379	29.8
Sebree	1502	103	22.9
Seneca Gardens	747	0	0.0
Sharpsburg	339	8	7.9
Shelbyville	5323	1181	74.0
Shepherdsville	4428	1053	79.3
Silver Grove	1260	145	38.4
Simpsonville	641	47	24.4
Slaughters	266	16	20.1
Smithfield	142	5	11.7
Smithland	520	58	37.2
Smiths Grove	761	73	32.0
Somerset	10649	2329	72.9
Sonora	412	74	59.9
S Carrollton	258	20	25.8
Southgate	2780	475	57.0
South Shore	1534	80	17.4
Sparta	193	18	31.1
Springfield	3169	432	45.4
Stamping Grnd	561	17	10.1
Stanford	2776	403	48.4
Stanton	2685	204	25.3
Sturgis	2284	277	40.4
Taylor Mill	4414	395	29.8
Taylorsville	799	70	29.2
Tollesboro	810	59	24.3
Tompkinsville	4335	331	25.5
Trenton	457	15	10.9
Union	598	63	35.1
Uniontown	1162	40	11.3
Upton	783	46	20.9
Vanceburg	1922	192	33.3
Versailles	6202	1082	58.2
Vicco	461	33	23.9
Villa Hills	4407	102	7.7
Vinegrove	3586	227	21.1
Visalia	198	24	40.4
Wallins Creek	461	34	24.6
Walton	1650	333	67.3
Warsaw	1304	120	30.7
Washington	622	38	20.4
Water Valley	338	11	9.5
Waverly	426	46	36.0
Wayland	611	18	9.8
West Liberty	1388	212	50.9
West Point	1326	172	43.2
Westwood	817	127	51.8
Wheatcroft	324	17	17.5
Wheelwright	862	14	5.4
White Plains	856	44	17.1
Whitesburg	1493	220	49.1
Whitesville	786	74	31.4
Wickliffe	1045	123	39.2
Wilder	640	407	212.0
Williamsburg	5459	680	41.5
Williamstown	3123	261	27.9
Willisburg	231	14	20.2
Wilmore	3790	86	7.6
Winchester	15212	2742	60.1
Winding Falls	0		
Wingo	607	42	23.1
Woodburn	317	13	13.7
Woodlawn	331	0	0.0
Worthington	1947	75	12.8
Worthville	279	5	6.0
Wurtland	1288	80	20.7
Yorktown	154	4	8.7

No cities were identified as having fatal accident rates above critical.

General Accident Statistics

Statistics were summarized by accident type and by county (Table 10). Accident classifications included pedestrian, bicycle, school bus, combination truck, single-unit truck, emergency vehicle, motorcycle, and train. Rates were calculated in terms of accidents per 10,000 population. Also, a rate in terms of motorcycle accidents per 100 registered motorcycles was determined. These rates were used when identifying counties with high rates for particular accident types.

Other miscellaneous data for each county were tabulated and used for problem identification (Table 11). These data included the percentages of accidents involving speeding, alcohol, and drugs; percentage of drivers using safety equipment; percentage fatal accidents, percentage injury-or-fatal accidents; number of accidents by county by year; the percentage change in the 1979 accident total from the three-year annual average; and the lapsed times from the time when police were notified of an accident to when they arrived at the scene. An analysis of contributing factors (human, vehicular, and roadway) was also used in the problem identification (Table 12). The percentage of accidents in which a given factor was listed as a contributing factor was summarized for various accident types. A summary of accident severity for various types of accidents was also made (Table 13).

An accident trend analysis was done for several types of accident statistics (Table 14). In this analysis, three years of accident data (1977-1979) were averaged and the percent difference between the 1979 number and the three-year average was determined. There has been only a slight change in the number of total, fatal, and injury accidents in this three-year period. Also, the number of fatalities and injuries changed only slightly.

Table 10. Accidents and Accident Rates by Accident Type for Each County.*

COUNTY	PEDESTRIAN ACCIDENTS		BICYCLE ACCIDENTS		SCHOOL BUS ACCIDENTS		COMBINATION TRUCK ACCIDENTS		SINGLE-UNIT TRUCK ACCIDENTS		EMERGENCY VEHICLE ACCIDENTS		MOTORCYCLE ACCIDENTS		NUMBER OF REGISTERED MOTORCYCLES	ACCIDENTS PER 100 REGISTERED MOTORCYCLES	TRAIN ACCIDENTS		COMMERCIAL BUS ACCIDENTS	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE			NUMBER	RATE	NUMBER	RATE
Adair	9	2.0	3	0.7	8	1.8	25	5.5	69	15.2	4	0.9	8	1.8	266	1.0	0	0.0	0	0.0
Allen	7	1.7	0	0.0	8	1.9	26	6.2	46	10.9	2	0.5	10	2.4	200	1.7	0	0.0	3	0.7
Anderson	19	5.0	5	1.3	10	2.7	51	13.5	90	23.9	4	1.1	16	4.3	208	2.6	7	1.9	8	2.1
Ballard	5	1.7	8	2.6	2	0.7	57	18.8	66	21.8	2	0.7	15	4.9	149	3.1	0	0.0	1	0.3
Barren	30	3.0	12	1.2	13	1.3	135	13.4	231	22.8	7	0.7	43	4.3	520	2.8	3	0.3	3	0.3
Bath	10	3.3	1	0.3	3	1.0	30	10.1	34	11.3	2	0.7	5	1.7	131	1.3	0	0.0	0	0.0
Bell	49	5.1	16	1.7	8	0.8	104	10.8	286	29.6	17	1.8	33	3.4	321	3.4	4	0.4	13	1.3
Bonne	78	5.7	31	2.3	24	1.8	671	49.1	505	37.0	28	2.1	104	7.6	972	3.6	2	0.2	35	2.6
Bourbon	22	3.4	10	1.7	6	1.0	82	14.1	133	22.9	10	1.7	21	3.6	233	3.0	1	0.2	7	1.2
Boyd	82	4.9	33	2.0	44	2.6	339	20.4	772	46.4	28	1.7	99	6.0	1,027	3.2	19	1.1	26	1.6
Boyle	20	2.7	20	2.7	2	0.3	60	8.0	188	25.1	10	1.3	32	4.3	527	2.0	4	0.5	5	0.7
Bracken	1	0.4	1	0.4	2	0.9	4	1.7	25	10.8	0	0.0	6	2.6	108	1.9	1	0.4	0	0.0
Breathitt	11	2.2	4	0.8	11	2.2	103	20.3	236	46.4	6	1.2	16	3.2	223	2.4	2	0.4	5	1.0
Breckenridge	9	1.8	2	0.4	6	1.2	56	11.1	84	16.6	4	0.8	17	3.4	260	2.2	0	0.0	2	0.4
Bullitt	35	2.7	18	1.4	19	1.5	204	15.8	315	24.3	23	1.8	60	4.6	819	2.4	9	0.7	8	0.6
Butler	7	2.1	0	0.0	10	3.0	47	14.2	77	23.3	1	0.3	7	2.1	164	1.4	0	0.0	1	0.3
Caldwell	28	5.7	3	0.7	10	2.5	56	13.9	103	26.7	1	0.3	23	5.7	293	2.6	1	0.3	3	0.7
Calloway	28	2.9	5	0.6	4	0.4	69	7.7	193	21.5	10	1.1	52	5.8	692	2.5	2	0.2	5	0.6
Campbell	270	10.9	110	4.4	29	1.2	254	10.2	801	32.3	36	1.5	123	5.0	1,151	3.6	28	0.9	90	3.6
Carlisle	7	4.3	2	1.2	6	3.7	21	12.8	37	22.5	1	0.6	4	2.4	62	2.2	1	0.6	2	1.2
Carroll	12	4.3	9	3.2	6	2.2	131	47.0	80	23.7	7	2.5	16	5.7	157	3.4	11	4.0	1	0.4
Carter	17	2.3	2	0.3	11	1.5	100	13.3	164	21.8	2	0.3	24	3.2	351	2.3	3	0.4	4	0.5
Casey	1	0.2	0	0.0	6	1.4	17	3.8	66	14.9	4	0.9	6	1.4	222	0.9	0	0.0	1	0.2
Christian	85	4.3	30	1.5	26	1.3	208	10.5	386	19.4	17	0.9	78	3.9	354	3.0	19	1.0	20	1.0
Clark	40	4.7	7	0.8	26	3.1	138	16.2	240	28.2	4	0.5	54	6.4	360	5.0	8	0.9	17	2.0
Clay	17	2.5	1	0.2	12	1.8	104	15.3	151	22.2	5	0.7	16	2.4	257	2.1	3	0.4	3	0.4
Clinton	3	1.1	0	0.0	4	1.5	9	3.3	70	25.8	1	0.4	9	3.3	147	2.0	0	0.0	5	1.8
Crittenden	9	3.3	3	1.1	7	2.5	38	13.7	55	19.9	6	2.2	7	2.5	198	1.2	1	0.4	0	0.0
Cumberland	2	0.9	0	0.0	1	0.5	16	7.4	60	27.7	0	0.0	5	2.3	82	2.0	0	0.0	0	0.0
Daviess	118	4.6	134	5.2	66	2.6	387	15.1	530	20.6	28	1.1	137	5.3	1,712	2.7	43	1.7	26	1.0
Edmonson	5	1.7	2	0.7	3	1.0	19	6.3	46	15.3	0	0.0	5	1.7	87	1.9	0	0.0	3	1.0
Elliott	3	1.5	2	1.0	0	0.0	55	26.8	40	19.5	1	0.5	4	2.0	79	1.7	0	0.0	0	0.0
Estill	6	1.4	0	0.0	4	0.9	22	5.1	94	21.6	3	0.7	10	2.3	221	1.5	1	0.2	1	0.2
Fayette	508	8.3	230	3.8	170	2.8	1,117	18.3	1,765	29.0	100	1.6	424	7.0	4,333	3.3	42	0.7	223	3.7
Fleming	2	0.5	1	0.3	3	0.8	38	10.3	91	24.6	0	0.0	6	1.6	422	0.5	0	0.0	6	1.6
Floyd	28	1.9	10	0.7	30	2.1	97	6.7	646	44.4	14	1.0	30	2.1	559	1.8	15	1.0	5	0.3
Franklin	66	5.3	22	1.8	31	2.5	208	16.6	386	30.8	40	3.2	70	5.6	670	3.5	6	0.6	17	1.4
Fulton	5	1.9	4	1.5	1	0.4	25	9.3	33	12.3	1	0.4	9	3.4	139	2.2	0	0.0	0	0.0
Gallatin	5	3.5	4	2.8	5	3.5	74	51.2	50	34.6	6	4.2	4	2.8	59	2.3	0	0.0	2	1.4
Garrard	11	3.4	3	0.9	1	0.3	21	6.5	67	20.1	4	1.2	14	4.3	228	2.1	0	0.0	1	0.3
Grant	12	3.0	5	1.3	9	2.3	168	42.2	178	44.7	13	3.3	15	3.8	227	2.2	6	1.5	3	0.8
Graves	27	2.6	16	1.6	3	0.3	122	11.9	202	19.7	11	1.1	58	5.7	570	3.4	2	0.2	7	0.7
Grayson	21	3.4	8	1.3	12	2.0	67	10.9	145	23.6	10	1.6	23	3.8	351	2.2	8	1.3	8	1.3
Green	6	1.8	2	0.6	8	2.4	46	14.0	125	38.0	0	0.0	9	2.7	227	1.3	0	0.0	1	0.3
Greenup	28	2.4	13	1.1	28	2.2	81	7.0	231	19.8	11	0.9	43	3.7	834	1.7	16	1.4	10	0.9
Hancock	2	0.9	0	0.0	2	0.9	42	18.2	38	16.4	1	0.4	2	0.9	160	0.4	1	0.4	1	0.4
Hardin	74	2.8	29	1.1	40	1.5	428	16.0	594	22.3	28	1.1	179	6.7	2,354	2.5	11	0.4	30	1.1
Harlan	50	4.0	14	1.1	19	1.5	125	9.9	422	33.5	19	1.5	49	3.9	591	3.3	16	1.4	13	1.0
Harrison	19	4.2	4	0.9	5	1.1	45	9.9	125	27.5	3	0.7	18	4.0	311	1.9	3	0.7	4	0.9
Hart	11	2.4	4	0.9	5	1.1	115	25.3	80	17.6	5	1.1	8	1.8	229	1.2	3	0.7	3	0.7
Henderson	109	8.9	48	3.9	21	1.7	397	32.4	440	36.0	18	1.5	87	7.1	765	3.9	15	1.2	28	2.3
Henry	21	5.5	2	0.5	8	2.1	88	23.1	71	18.7	4	1.1	10	2.6	235	1.4	0	0.0	0	0.0
Hickman	4	2.2	1	0.6	2	1.1	32	17.6	33	18.1	1	0.6	3	1.7	81	1.2	1	0.6	1	0.6
Hopkins	50	3.6	25	1.8	17	1.2	317	22.9	336	24.3	33	2.4	90	6.5	1,245	2.4	4	0.3	16	1.2
Jackson	5	1.4	1	0.3	5	1.4	29	8.1	81	22.6	1	0.3	8	2.2	200	1.3	0	0.0	0	0.0
Jefferson	1701	8.3	771	3.8	531	2.6	2,398	11.7	13,274	64.9	326	1.6	1,429	7.0	10,702	4.5	157	0.7	1,263	6.2
Jessamine	13	1.7	6	0.8	28	2.9	52	6.7	278	35.6	7	0.9	33	4.2	377	2.9	0	0.0	10	1.3
Johnson	14	1.9	2	0.3	6	0.8	150	20.6	373	51.1	11	1.5	24	3.3	663	1.5	8	1.1	9	1.2
Kenton	425	10.4	159	3.9	95	2.3	896	21.9	1,482	36.3	79	1.9	233	5.7	2,334	3.3	19	0.5	237	5.8
Knott	14	2.6	1	0.2	10	1.9	40	7.5	194	36.2	8	1.5	17	3.2	178	3.2	0	0.0	1	0.2
Knox	25	2.8	6	0.7	14	1.6	88	9.8	222	24.7	4	0.5	32	3.6	291	3.7	13	1.5	9	1.0
Larue	11	3.1	5	1.4	2	0.6	59	16.6	67	18.9	7	2.0	13	3.7	311	1.4	1	0.3	3	0.8
Laurel	41	3.6	10	0.9	31	2.7	313	27.2	375	32.6	15	1.3	72	6.3	760	3.2	11	1.0	14	1.2
Lawrence	11	2.6	1	0.2	4	0.9	175	41.3	146	34.4	5	1.2	12	2.8	145	2.8	3	0.7	2	0.5
Lee	9	3.9	0	0.0	9	3.9	36	16.5	44	19.2	6	2.6	1	0.4	98	0.3	2	0.9	0	0.0
Leslie	11	2.5	0	0.0	2	0.5	29	6.5	118	26.5	2	0.5	9	2.0	138	2.2	0	0.0	1	0.2
Letcher	22	2.4	4	0.4	10	1.1	80	8.8	169	18.6	8	0.9	20	2.2	459	1.4	6	0.7	2	0.2
Lewis	10	2.3	5	1.2	3	0.7	25	5.7	52	11.9	1	0.2	11	2.5	188	2.0	8	1.8	2	0.5
Lincoln	8	1.4	4	0.7	11	1.9	43	7.6	101	17.7	5	0.9	12	2.1	312	1.3	13	2.3	5	0.9
Livingston	3	1.1	0	0.0	6	2.2	29	10.5	44	15.2	5	1.8	14	5.0	151	3.1	0	0.0	4	1.4
Logan	23	3.2	7	1.0	19	2.6	93	12.9	134	16.6	7	1.3	22	3.1	355	2.1	1	0.1	9	1.3
Lyon	0	0.0	3	1.5	1	0.5	27	13.8	33	16.9	0	0.0	9	4.6	73	4.1	0	0.0	3	1.5
McCracken	84	4.6	44	2.4	24	1.3	263	14.3	582	31.7	32	1.7	159	8.7	1,225	4.3	11	0.6	20	1.1
McCreary	12	2.6	1	0.2	3	0.6	34	7.3	70	15.0	3	0.6	16	3.4	181	3.0	12	2.6	1	0.2
McLean	5	1.7	3	1.0	5	1.7	25	8.3	53	17.6	1	0.3	8	2.7	209	1.3	0	0.0	1	0.3
Madison	66	4.1	33	2.1	28	1.6	302	18.9	491	30.7	41	2.6	72	4.5	831	2.9	6	0.4	18	1.1
Magoffin	12	3.0	0	0.0	2	0.5	49	12.1	163	40.4	9	2.2	7	1.7	97	2.4	2	0.5	1	0.3
Marion	15	2.8	12	2.3	16	3.0	45	8.5	123	23.3	6	1.1	19	3.6	216	2.9	9	1.7	3	0.6
Marshall	15	2.0	7	0.9	10	1.3	151	19.6	170	22.1	9	1.2	31	4.0	317	3.3	1	0.1	4	0.5
Martin	10	2.4	0	0.0	3	0.7	26	6.2	82	19.6	8	1.9	8	1.9	166	1.6	0	0.0	0	0.0
Mason	14	2.7	9	1.7	16	3.0	124	23.4	238	45.2	11	2.1	28	5.3	368	2.5	3	0.6	17	3.2
Meade	17	2.5	3	0.4	4	0.6	34	5.0	143	20.9	3	0.4	47	6.9	335	4.1	1	0.2	2	0.3
Menifee	3	2.0	1	0.7	3	2.0	3	2.0	26	17.1	1	0.7	7	4.6	79	3.0	0	0.0	0	0.0
Mercer	18	3.2	7	1.2	5	0.9	65	11.5	95	16.8	2	0.4	30	5.3	393	2.5	4	0.7	4	0.7
Metcalfe	3	1.1	1	0.4	3	1.1	15	5.3	47	16.6	2	0.7	7	2.5	95	2.5	0	0.0	0	0.0
Monroe	6	1.6	0	0.0	5	1.4	11	3.0	33	9.0	2	0.5	11	3.0	128	2.8	0	0.0	1	0.3
Montgomery	21	3.5	6	1.0	6	1.0	78	13.0	121	20.1	6	1.0	14	2.3	227	2.1	0	0.0	5	0.8
Morgan	7	1.9	3	0.8	7	1.9	57	15.7	93	25.7	0	0.0	12	3.3	172	2.3	0	0.0	1	0.3
Muhlenburg	24	2.5	7	0.7	9	0.9	100	10.3	285	29.5	8	0.8	30	3.1	438	2.3	3	0.3	9	0.9
Nelson	27	3.3	11	1.3	16	1.9	75	9.1	158	19.2	12	1.5	34	4.1	808	1.4	5	0.6	2	0.2
Nicholas	1	0.5	0	0.0	2	0.9	16	7.4	18	8.4	1	0.5	1	0.5	158	0.2	0	0.0	1	0.5
Ohio	12	1.8	4	0.6	13	2.0	101	15.4	169	25.8	12	1.8	24	3.7	336	2.4	10	1.5	7	1.1
Oldham	12	1.4	5	0.6	3	0.4	111	13.4	178	21.4	7	0.8	33	4.0	441	2.5	15	1.8	9	1.1
Owen	4	1.5	1	0.4	6	2.3	8	3.1	43	16.5	0	0.0	5	1.9	142	1.2	0	0.0	0	0.0
Owsley	4	2.3	0	0.0	0	0.0	12	7.0	28	16.4	2	1.2	2	1.2	55	1.2	0	0.0	0	0.0
Pendleton	6	1.8	1	0.3	1	0.3	26	7.9	52	15.8	5	1.5	6	1.8	148	1.4	1	0.3	1	0.3
Perry	37	3.7	19	0.9	18	1.8	164	16.4	444	44.4	19	1.9	57	5.7	662	2.3	12	1.2	6	0.6
Pike	72	3.0	17	0.7	36	1.5	281	11.6	1,012	41.8	30	1.2	78	3.2	1,167	2.2	22	0.9	11	0.5
Powell	10	3.0	1	0.3	3	0.9	43	12.9	59	17.8	4	1.2	17	5.1	168	3.4	0	0.0	0	0.0
Pulaski	37	2.7	10	0.7	31	2.3	138	10.1	352	25.7	7	0.5	47	3.4	719	2.2	7	0.5	7	0.5
Robertson	1	1.5	0	0.0	1	1.5	4	5.8	6	8.8	0	0.0	1	1.5	27	1.2	0	0.0	0	0.0
Rockcastle	9	2.2	3	0.7	6	1.4	122	29.2	144	34.5	8	1.9	13	3.1	180	2.4	3	0.7	5	1.2
Rowan	18	3.2	8	1.4	10	1.8	64	11.2	111	19.5	5	0.9	12	2.1	215	1.9	1	0.2	3	0.5
Russell	4	1.0	1	0.3	1	0.3	12	3.0	34	8.4	2	0.5	14	3.5	232	2.0	0	0.0	0	0.0
Scott	19	2.9	11	1.7	9	1.4	165	25.3	104	15.9	13	2.0	21	3.2	438	1.6	1	0.2	6	0.9
Shelby	22	3.1	14	2.0	15	2.1	128	18.0	193	27.1	13	1.8	26	3.7	352	2.5	8	1.1	4	0.6
Simpson	10	2.3	1	0.2	4	0.9	110	25.2	95	21.7	0	0.0	19	4.3	220	2.9	6	1.4	7	1.6
Spencer	3	1.7	1	0.6	4	2.2	16	9.0	29	16.2	0	0.0	6	3.4	133	1.5	0	0.0	7	0.6
Taylor	15	2.4	4	0.6	7	1.1	35	5.6	144	23.0	7	1.1	28	4.5	530	1.8	0	0.0	9	1.4
Todd	5	1.4	2	0.6	1	0.3	34	9.7	60	17.2	5	1.4	13	3.7	199	2.2	1	0.3	4	1.2
Trigg	10	3.7	1	0.4	5	1.8	80	28.5	71	25.3	2	0.7	16	5.7	166	3.2	2	0.7	4	1.4
Trimble	3	1.6	3	1.6	3	1.6	14	7.4	23	12.2	1	0.5	7	3.7	156	1.5	0	0.0	1	0.5
Union	15	2.8	11	2.1	14	2.6	79	14.8	162	30.3	6	1.1	24	4.5	405	2.0	1	0.2	3	0.6
Warren	94	4.5	63	3.0	41	2.0	377	17.9	408	19.4	46	2.2	172	8.2	1,465	3.9	17	0.8	22	1.1
Washington	7	2.2	2	0.6	5	1.6	20	6.2	67	20.8	1	0.3	7	2.2	205	1.1	0	0.0	3	0.9
Wayne	10	2.0	5	1.0	4	0.8	28	5.5	89	17.5	2	0.4	6	1.2	192	1.0	0	0.0	1	0.2
Webster	15	3.4	2	0.5	3	0.7	126	28.3	145	32.6	7	1.6	22	4.9	297	2.5	14	3.1	7	1.6
Whitley	35	3.4	8	0.8	22	2.2	168	17.1	254	25.9	9	0.9	57	5.8	644	3.0	9	0.9	14	1.4
Wolfe	6	3.0	0	0.0	3	1.5	48	23.8	57	28.3	3	1.5	5	2.5	103	1.6	0	0.0	1	0.5
Woodford	15	2.8	4	0.8	2	0.4	63	11.9	131	24.8	7	1.3	17	3.2	250	2.3	10	1.9	3	0.6

* Rates are annual accidents per 10,000 population.

Table 11. Miscellaneous Accident Data for Each County.

COUNTY	PERCENT OF ACCIDENTS INVOLVING SPEEDING	PERCENT OF ACCIDENTS INVOLVING ALCOHOL	PERCENT OF ACCIDENTS INVOLVING DRUGS	PERCENT OF DRIVERS USING SAFETY EQUIPMENT	FATAL ACCIDENTS		NUMBER OF FATAL AND INJURY ACCIDENTS	PERCENT OF FATAL AND INJURY ACCIDENTS	NUMBER OF ACCIDENTS BY YEAR			THREE YEAR AVERAGE	1979 PERCENT CHANGE	LAPSED TIME NOTIFIED TO ARRIVED PERCENT GREATER THAN 10 MINUTES
					NUMBER OF ACCIDENTS	PERCENT OF ACCIDENTS			1977	1978	1979			
Adair	9.6	9.3	0.4	0.8	4	0.40	211	21	325	306	366	332	+10.2	26.9
Allen	20.6	6.7	0.2	1.8	16	1.95	236	29	240	292	288	273	+5.5	27.3
Anderson	12.8	6.3	0.1	3.2	7	5.51	264	22	421	422	426	423	+0.7	23.5
Ballard	19.0	8.2	0.0	1.9	4	5.64	242	34	204	295	230	236	-2.6	60.1
Barren	8.5	5.5	0.1	1.5	29	7.74	930	26	1,159	1,295	1,290	1,248	+3.4	25.0
Bath	18.3	13.1	0.6	3.8	7	0.01	137	28	167	162	169	165	+1.8	57.2
Bell	9.5	7.3	0.4	2.6	30	1.07	721	26	942	937	933	937	-0.4	22.8
Boone	8.9	6.7	0.4	7.7	36	4.23	1,709	20	2,654	3,018	2,347	2,639	+0.3	26.3
Bourbon	13.9	9.4	0.6	3.0	24	0.01	602	26	743	754	763	753	+2.6	24.2
Boyd	6.1	4.0	0.3	3.2	22	2.44	1,529	17	2,835	3,246	2,869	3,006	-4.0	15.7
Boyle	8.5	4.4	0.3	3.1	14	0.42	561	18	1,077	1,104	1,119	1,100	+1.7	20.1
Bracken	12.8	7.8	0.4	1.7	12	4.27	59	21	78	97	106	93	+14.0	32.8
Breathitt	27.7	9.3	0.1	1.8	18	1.74	359	35	347	324	364	345	+5.5	64.2
Breckenridge	10.0	6.1	0.1	2.1	15	1.09	305	22	504	419	469	457	-1.8	40.1
Bullitt	9.1	7.7	0.4	4.2	35	1.00	943	27	1,172	1,182	1,143	1,165	-1.9	23.5
Butler	7.9	6.6	0.0	2.9	19	2.60	241	32	265	268	225	253	-11.9	50.9
Caldwell	6.2	3.2	0.4	1.2	10	0.63	342	22	546	581	535	527	+1.5	19.9
Calloway	7.7	5.3	0.5	2.0	25	0.80	948	24	1,033	1,095	935	1,037	-5.3	18.0
Campbell	3.3	5.1	0.3	4.5	26	0.24	2,115	16	4,365	4,429	4,259	4,357	-2.3	6.5
Carlisle	19.4	6.0	0.6	1.2	8	2.28	130	37	126	105	120	117	+2.6	66.3
Carroll	12.2	7.5	0.1	4.6	20	1.29	330	21	492	559	522	517	+1.0	25.9
Carter	18.8	8.4	0.2	2.6	20	1.06	462	24	644	637	608	629	-3.4	42.8
Casey	15.7	9.8	0.1	1.1	9	1.31	183	27	179	264	223	228	-2.2	52.1
Christian	9.6	7.2	0.2	4.7	42	0.57	1,446	20	2,479	2,506	2,352	2,449	+3.7	16.4
Clark	11.3	7.5	0.3	3.2	16	0.46	821	20	1,312	1,446	1,349	1,369	-1.5	17.5
Clay	18.4	7.7	0.1	2.0	22	1.55	342	24	472	468	482	474	+1.7	47.0
Clinton	6.4	9.2	0.4	1.0	6	1.20	137	27	189	160	153	167	-9.2	33.0
Crittenden	10.1	6.0	0.4	0.9	8	1.02	217	28	273	235	273	260	+5.0	22.2
Cumberland	11.2	7.3	0.5	1.4	2	0.52	73	19	59	151	135	128	+5.5	30.6
Daviess	5.6	6.3	0.4	3.5	39	0.27	2,535	17	4,780	5,045	4,748	4,857	-2.3	9.6
Edmonson	23.9	8.0	0.3	1.7	12	1.88	227	36	228	209	200	212	-0.1	53.2
Elliott	22.7	8.2	0.0	2.1	9	2.23	124	31	150	155	144	134	+2.5	71.2
Estill	14.0	6.3	0.2	1.3	8	0.89	185	21	275	268	333	292	+11.7	30.2
Fayette	5.5	7.0	0.2	11.9	82	0.23	7,027	19	11,605	12,051	12,602	12,086	+4.3	26.2
Fleming	12.3	5.8	0.2	2.3	13	1.43	212	24	269	290	300	293	+2.4	34.0
Floyd	17.2	7.6	0.1	4.0	31	0.92	871	26	1,003	1,097	1,263	1,121	+12.7	52.0
Franklin	9.6	6.2	0.2	5.7	15	0.24	1,085	17	2,159	2,106	2,010	2,099	-4.4	16.2
Fulton	8.4	8.7	0.6	2.3	3	0.41	158	22	146	291	268	241	+19.5	15.8
Gallatin	22.5	9.6	0.9	8.4	7	1.23	177	31	184	168	218	190	+14.7	44.7
Garrard	22.8	7.0	0.1	1.8	15	1.55	267	28	292	327	351	323	+6.7	39.9
Grant	26.2	7.7	0.4	9.4	9	0.51	529	30	581	620	569	590	-3.7	48.6
Graves	8.4	5.5	0.2	4.2	28	0.76	859	23	1,176	1,310	1,198	1,228	-2.5	29.6
Grayson	13.3	6.3	0.4	3.6	13	0.65	448	23	639	670	687	655	+4.9	38.4
Green	6.7	3.8	0.0	1.2	10	1.18	222	26	301	283	264	282	-6.8	31.2
Greenup	8.2	5.0	0.3	6.6	15	0.48	736	23	997	1,157	1,015	1,049	-3.3	29.1
Hancock	9.5	5.6	0.0	3.3	2	0.43	113	24	132	188	141	154	-9.2	26.3
Hardin	13.5	7.4	0.2	6.8	43	0.56	1,834	25	2,344	2,745	2,602	2,563	+1.5	23.0
Harlan	13.1	10.4	0.4	2.6	34	0.98	803	23	1,344	1,031	1,060	1,161	-9.5	46.9
Harrison	9.8	5.9	0.1	1.5	7	0.45	261	17	467	565	489	517	-5.7	25.4
Hart	14.6	9.9	0.1	4.5	19	1.66	358	31	357	383	405	381	+6.3	43.2
Henderson	7.1	6.6	0.2	3.1	40	0.56	1,536	21	2,233	2,478	2,361	2,364	+0.7	18.1
Henry	30.5	10.6	0.0	3.8	10	1.00	248	25	327	350	327	334	-2.1	57.9
Hickman	16.9	11.0	1.0	3.7	6	1.43	136	32	116	148	160	139	+15.1	41.0
Hopkins	10.5	6.5	0.2	3.1	30	0.53	1,283	23	1,735	1,946	1,848	1,876	+3.8	23.0
Jackson	17.8	7.1	0.0	1.4	9	1.65	132	24	187	197	182	189	+5.5	50.7
Jefferson	6.3	4.7	0.2	11.5	308	0.27	18,703	16	39,537	39,738	36,343	38,539	-6.0	21.7
Jessamine	10.9	6.3	0.1	1.1	22	0.67	475	19	831	815	884	843	+4.9	22.1
Johnson	9.3	6.4	0.2	3.5	22	0.95	463	20	848	726	747	772	-3.3	35.1
Kenton	5.1	7.0	0.4	5.6	42	0.17	4,203	17	8,901	6,103	7,633	8,299	-5.9	8.4
Knott	29.6	11.2	0.2	1.7	16	1.77	294	33	282	292	329	301	+9.3	72.0
Knox	12.5	8.2	0.1	3.3	26	1.32	586	30	665	645	721	657	+9.7	40.7
Larue	17.9	7.0	0.0	2.6	16	0.79	240	14	1,357	340	332	343	-3.3	35.8
Laurel	15.1	6.2	0.1	4.1	31	0.78	892	25	1,229	1,338	1,301	1,319	-1.4	36.8
Lawrence	10.1	9.0	0.3	2.7	12	0.59	348	28	333	408	427	406	+5.2	45.2
Lee	24.0	8.7	0.5	0.9	7	1.68	99	24	132	131	103	122	-34.0	47.3
Leslie	29.5	10.3	0.0	1.3	20	3.27	208	34	215	202	194	203	-4.5	77.1
Letcher	28.9	7.0	0.0	0.9	25	1.97	360	30	428	370	470	422	+11.4	63.6
Lewis	18.5	7.8	0.1	1.0	12	1.30	257	28	251	312	359	307	+16.9	53.4
Lincoln	10.7	6.3	0.1	1.4	17	1.40	295	24	405	401	402	403	-0.2	41.6
Livingston	15.3	8.3	0.8	2.3	5	0.75	193	29	220	227	219	222	-1.4	69.5
Logan	6.6	7.6	0.3	1.9	17	0.74	636	28	676	807	819	767	+6.8	26.9
Lyon	10.4	7.0	0.0	2.5	6	1.27	134	28	153	132	176	157	+12.1	48.9
McCracken	7.4	7.3	0.5	4.5	35	0.38	1,208	13	2,936	3,110	3,097	3,048	+1.6	14.8
McCreary	23.2	12.8	0.0	4.6	19	2.70	194	28	207	263	234	234	0.0	35.1
McLean	9.9	6.2	0.5	4.2	8	1.34	205	34	185	221	181	196	-4.2	66.0
Madison	12.7	7.9	0.2	3.3	28	0.38	1,245	17	2,467	2,509	2,426	2,467	-1.7	21.7
Magoffin	26.6	10.6	0.1	5.0	13	1.65	295	37	238	245	279	253	+5.1	54.1
Marion	10.9	10.8	0.3	1.5	13	0.67	378	20	593	620	720	644	+11.8	29.5
Marshall	13.3	7.4	0.5	3.1	23	0.94	662	27	803	856	797	818	-2.6	35.2
Martin	23.6	8.8	0.4	3.5	11	1.93	137	24	190	212	167	189	-13.2	57.9
Mason	3.9	4.2	0.1	1.4	15	0.48	489	16	962	1,095	1,060	1,049	+3.9	21.4
Meade	14.3	12.9	0.4	3.6	24	1.31	583	32	598	642	596	612	-2.7	39.2
Menifee	28.8	13.2	0.0	3.8	7	2.72	80	31	87	68	102	85	+20.0	77.5
Mercer	10.4	7.8	0.3	2.3	11	0.53	383	19	710	693	661	688	-4.1	20.8
Metcalfe	17.1	13.3	0.5	2.6	8	2.04	123	31	118	113	161	130	+23.8	61.3
Monroe	19.6	11.2	1.0	1.7	16	2.60	161	26	101	221	294	205	+43.4	30.2
Montgomery	9.0	7.1	0.2	1.5	12	0.62	384	20	606	659	679	648	+4.8	22.9
Morgan	18.8	8.4	0.0	1.4	12	1.41	255	30	282	319	269	283	+5.7	58.3
Muhlenburg	15.1	6.9	0.2	1.8	23	0.72	794	25	1,045	1,013	1,138	1,065	+6.9	32.0
Nelson	11.6	9.5	0.2	4.4	20	0.69	648	22	960	1,020	917	965	-5.2	31.1
Nicholas	15.0	6.3	0.3	1.2	2	0.67	84	28	130	91	79	100	-25.6	44.4
Ohio	15.5	6.4	0.2	3.0	23	1.40	469	28	615	548	481	548	-13.5	43.8
Oldham	23.8	8.8	0.5	9.2	18	0.69	567	29	676	696	657	676	-2.9	36.4
Owen	20.8	5.3	0.4	2.6	7	1.49	133	28	136	170	165	157	+5.1	53.8
Owsley	21.3	6.2	0.0	1.9	6	2.33	68	26	84	78	96	86	+11.6	41.0
Pendleton	23.5	8.5	0.1	5.8	8	0.98	217	26	289	287	244	273	-11.9	48.2
Perry	17.9	7.9	0.3	1.2	32	0.94	757	28	981	1,168	1,248	1,130	+10.4	40.6
Pike	14.9	5.4	0.1	2.7	38	0.61	1,669	27	2,905	2,918	2,280	2,684	-7.0	54.7
Powell	10.4	8.4	0.2	1.5	8	1.02	214	27	246	253	241	262	-8.7	33.2
Pulaski	10.3	4.7	0.2	2.7	34	0.32	857	21	1,353	1,444	1,347	1,381	-2.5	26.2
Robertson	30.8	5.5	0.0	4.0	1	1.10	38	36	30	25	36	30	+20.0	49.4
Rockcastle	26.1	7.6	0.2	4.8	19	1.63	263	24	414	359	351	338	+0.8	46.0
Rowan	11.4	6.5	0.6	3.1	9	0.37	493	20	791	814	809	804	+0.6	28.6
Russell	15.2	11.9	0.2	2.9	13	2.35	148	27	164	177	213	184	+15.8	44.2
Scott	9.7	6.3	0.4	4.5	12	0.43	585	21	933	974	906	937	-3.4	21.7
Shelby	16.3	8.4	0.4	5.5	20	0.72	635	25	912	940	931	927	+0.4	28.3
Simpson	9.0	5.5	0.0	1.9	12	0.82	371	25	456	489	515	486	+6.0	23.0
Spencer	25.9	13.6	0.8	4.6	8	2.18	152	41	99	153	109	122	-11.9	53.0
Taylor	6.2	5.4	0.2	1.7	20	1.02	412	21	643	677	643	655	-1.9	16.3
Todd	22.6	9.1	0.7	2.5	13	1.83	203	29	224	254	253	237	+6.8	49.5
Trigg	13.2	5.5	0.3	3.0	8	0.70	232	25	369	421	358	382	-6.7	31.4
Trimble	22.7	8.4	0.6	2.5	4	1.12	105	29	136	109	112	119	-3.3	61.1
Union	13.0	10.2	0.3	1.7	17	0.94	453	25	544	653	612	603	+1.5	29.5
Warren	6.1	7.1	0.4	2.8	61	0.45	2,473	19	4,271	4,433	4,539	4,414	+2.4	15.6
Washington	14.3	5.0	0.6	2.0	6	0.67	159	18	319	233	339	300	-0.3	33.2
Wayne	11.1	6.3	0.4	1.5	10	0.66	226	19	398	441	418	359	+7.5	18.5
Webster	8.7	7.0	0.3	3.3	16	1.08	359	24	451	516	472	493	-4.4	39.7
Whitley	10.7	5.0	0.5	3.1	24	0.75	621	20	1,040	1,227	916	1,061	-15.8	30.9
Wolfe	21.9	10.1	0.4	3.0	15	2.95	141	28	173	186	120	167	+1.8	72.3
Woodford	8.1	7.1	0.1	4.6	12	0.55	439	20	745	698	753	732	+2.9	12.9

Table 12. Accident Contributing Factors for Various Accident Types.

CONTRIBUTING FACTOR	PERCENT OF ACCIDENTS INVOLVING GIVEN FACTOR										
	ALL ACCIDENTS	PEDESTRIAN ACCIDENTS	BICYCLE ACCIDENTS	MOTORCYCLE ACCIDENTS	FATAL ACCIDENTS	SCHOOL BUS ACCIDENTS	COMBINATION TRUCK ACCIDENTS	SINGLE-UNIT TRUCK ACCIDENTS	EMERGENCY VEHICLE ACCIDENTS	TRAIN RELATED ACCIDENTS	COMMERCIAL BUS ACCIDENTS
Unsafe Speed	9.1	4.8	2.3	15.3	36.2	8.4	10.5	7.9	13.9	4.6	3.8
Failure to Yield Right of Way	16.9	5.4	6.8	24.5	15.9	18.2	14.4	17.9	20.0	26.4	14.3
Following Too Closely	5.0	0.2	0.3	3.9	0.7	5.4	6.2	6.1	2.2	0.1	5.6
Improper Passing	1.4	0.5	0.5	3.6	2.5	2.2	2.2	4.7	1.9	0.0	2.3
Disregard Traffic Controls	2.3	0.9	0.9	2.2	3.4	1.8	1.5	2.6	2.9	15.5	2.5
Improper Turn	2.7	0.6	0.6	3.5	0.7	3.5	4.0	3.5	2.6	0.3	5.8
Alcohol	6.4	3.6	1.6	6.1	23.5	0.9	3.0	3.5	6.2	4.8	1.8
Drugs	0.3	0.1	0.0	0.2	0.4	0.2	0.1	0.1	0.3	0.5	0.1
Sick	0.1	0.1	0.0	0.0	0.3	0.1	0.1	0.1	0.0	0.1	0.0
Fell Asleep	1.0	0.1	0.0	0.2	0.2	0.2	1.4	0.7	0.4	0.0	0.2
Lost Consciousness	0.2	0.0	0.0	0.1	0.4	0.1	0.1	0.1	0.0	0.4	0.1
Driver Inattention	22.2	9.3	7.6	17.7	10.9	22.2	22.3	21.9	20.9	21.3	18.6
Distraction	1.6	1.4	0.6	0.1	1.0	2.0	1.3	0.1	2.4	0.5	2.0
Physical Disability	0.2	0.2	0.1	0.1	0.4	0.1	0.2	0.1	0.2	0.6	0.2
Other (Human)	11.4	10.3	6.8	12.2	12.9	18.4	13.4	16.4	19.1	9.0	23.7
Brakes	2.1	1.1	0.5	1.6	1.3	5.9	5.0	3.9	2.3	2.4	3.9
Headlights	0.1	0.1	0.0	0.4	0.1	0.0	0.1	0.0	0.1	0.0	0.1
Other Lights	0.3	0.2	0.1	0.5	0.3	0.3	0.7	0.7	0.4	0.0	0.4
Steering Failure	0.4	0.0	0.0	0.5	0.2	0.2	0.5	0.4	0.4	0.5	0.2
Tire Failure-Inadequate	0.9	0.1	0.2	1.2	3.3	0.1	1.5	0.8	1.5	0.3	0.8
Tow Hitch Inadequate	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.3	0.0	0.1
Over or Improper Load	0.1	0.0	0.0	0.1	0.3	0.2	0.9	0.6	0.5	0.0	0.0
Over Sized Load	0.1	0.0	0.0	0.1	0.2	0.1	1.2	0.4	0.3	0.0	0.0
Other (Vehicular)	2.7	2.4	0.7	3.6	3.7	3.3	5.1	3.7	3.6	8.6	2.4
Animal Action	1.0	0.2	0.1	1.3	0.3	0.1	0.1	0.4	1.0	0.1	0.2
Glare	0.7	2.0	0.4	0.5	0.8	1.0	0.5	0.6	0.6	1.8	0.4
View Obstructed-Limited	3.1	4.5	4.5	3.7	3.0	5.0	3.2	3.0	4.2	6.8	2.4
Debris in Roadway	0.4	0.2	0.0	1.9	0.5	0.3	0.7	0.4	0.7	0.0	0.4
Improper-Non Work Traffic Controls	0.2	0.0	0.0	0.2	0.2	0.3	0.2	0.2	0.1	1.6	0.1
Shoulders Defective	0.5	0.1	0.1	0.3	1.2	1.1	1.1	0.8	0.5	0.4	0.2
Holes-Deep Ruts -Bumps	0.4	0.0	0.2	1.1	0.8	0.5	0.5	0.4	0.6	1.0	0.4
Road Under Construction	0.4	0.4	0.1	0.4	0.5	0.5	1.3	0.7	0.5	0.1	0.4
Improperly Parked Vehicles	0.6	0.9	0.1	0.3	0.5	1.0	0.8	0.8	1.1	2.3	1.8
Fixed Object	0.3	0.2	0.2	0.3	0.2	0.4	0.5	0.3	0.3	0.5	0.3
Slippery Surface	13.8	6.0	1.3	3.4	8.4	14.7	14.9	13.3	20.3	7.1	14.9
Water Pooling	0.5	0.1	0.0	0.3	0.7	0.2	0.5	0.3	0.8	0.1	0.1
Other (Roadway)	2.0	2.0	1.2	2.4	2.3	3.9	3.0	2.3	3.1	2.6	2.1

Table 13. Accident Severity for Various Accident Types.

VARIABLE	ALL	PEDESTRIANS	BICYCLES	MOTORCYCLES	SCHOOL BUSES	COMBINATION TRUCKS	SINGLE-UNIT TRUCKS	EMERGENCY VEHICLES	TRAINS	COMMERCIAL BUSES
Percent Fatal Accidents	0.54	6.37	1.60	3.01	0.19	1.38	0.72	0.40	3.51	0.28
Percent Injury Accidents	19.5	88.8	79.7	72.7	14.7	20.5	15.7	18.9	31.6	12.8

Table 14. Accident Trend Analysis.

NUMBER OF GIVEN TYPE OF ACCIDENT STATISTIC	1977	1978	1979	3-YEAR AVERAGE	1979 PERCENT CHANGE
Total Accidents	147,647	152,303	147,247	149,066	-1.2
Fatal Accidents	810	785	801	799	+0.3
Injury Accidents	28,679	29,019	29,447	29,048	+1.4
Fatal and Injury Accidents	29,489	29,804	30,248	29,847	+1.3
Speed-Related Accidents	14,034	13,497	12,994	13,508	-3.8
Alcohol-Related Accidents	9,245	9,117	10,140	9,500	+6.7
Drug-Related Accidents	323	383	452	386	+17.1
Pedestrians	1,778	1,717	1,764	1,753	+0.6
Bicycles	731	730	749	737	+1.6
Motorcycles	1,870	1,849	1,872	1,864	+0.4
School Buses	537	741	828	702	+17.9
Commercial Buses	979	839	684	834	-18.0
Combination Trucks	4,827	6,014	5,910	5,584	+5.8
Single-Unit Trucks	14,055	14,252	12,197	13,501	-9.7
Railroad Trains	279	270	249	266	-6.4
Emergency Vehicles	451	535	545	510	+6.9
Drivers Under 25	54,826	54,511	52,844	54,060	-2.2
Fatalities	958	893	905	919	-1.5
Injuries	43,957	44,403	44,814	44,391	+1.0

Fatal Accident Statistics

A comparison of fatal accidents with all accidents is presented in Table 15. Fatal accidents occurred most frequently in fixed-object, head-on, and pedestrian accidents and less frequently in rear-end, angle, and intersection accidents. A higher percentage of fatal accidents occurred at night, and a lower percentage on snowy or icy surfaces. Male drivers were found to be overrepresented in fatal accidents. Also, vehicles older than five years were overrepresented in fatal accidents.

Results from a previous study (5) showed the overall fatal accident rate for males was almost twice that for females. The rate was higher for males in every category except 70 years of age and older. Total and fatal accident rates among teenage drivers were very high. The rate decreased among middle-aged drivers and increased again for older drivers. The lowest fatal accident rate for both males and females was for drivers in the 50- to 59-year-old category.

Kentucky's fatal accident statistics are compared to nationwide statistics in Table 16. The statistics were taken from the 1977, 1978, and 1979 Fatal Accident Reporting System (6, 7, 8) and from RAPID. Kentucky's rate of fatal accidents per 100 MVM (160 MVK) is less than the national rate (2.84 for Kentucky and 3.11 nationwide). Other statistics of fatalities per 100 MVM (160 MVK) and fatalities per fatal accident for Kentucky were similar to nationwide statistics. The percentage of fatal accidents involving alcohol was lower in Kentucky than nationwide, and the percentage wearing safety equipment was higher in Kentucky. More fatal accidents occurred in Kentucky on state and US numbered routes and fewer on county and local roads, as compared to nationwide statistics.

The critical fatal accident rate for each population category is summarized in Table 2. Counties with rates exceeding the critical rates are listed in Table 17. The highest rate was in Owsley County. Most of the counties with fatal accident

Table 15. Comparison of Fatal Accidents with All Accidents.

VARIABLE	ALL ACCIDENTS	FATAL ACCIDENTS
Month with Highest Percentage	January	July
Day with Highest Percentage	Friday	Saturday*
Hour with Highest Percentage	4-5 PM	7-8 PM
Percent Involving Fixed Object	13.3	33.1
Percent Rear-End Collisions	26.6	4.3
Percent Angle Collisions	18.7	6.5
Percent Head-On or Opposite Direction Collisions	10.7	23.7
Percent Pedestrian Accidents	1.1	14.1
Percent Intersection Accidents	25.3	10.9
Percent on Wet Surface	18.4	16.3
Percent on Snow or Ice	12.2	3.5
Percent Nighttime Accidents	30.2	48.7
Percent Vehicles Older Than 5 Years	42.8	50.0*
Percent Vehicles Older Than 10 Years	11.0	13.4*
Percent Drivers Under 25 Years of Age	36.3	40.3
Percent Drivers Over 65 Years of Age	5.1	6.2
Percent Male Drivers	63.0	82.6

* Due to data restrictions, 1977 accidents were not included when determining this statistic.

Table 16. Comparison of Nationwide and Kentucky Fatal Accident Statistics.*

VARIABLE		NATIONWIDE	KENTUCKY
Fatal Accidents per 100 MVM		3.11	2.84
Fatalities per 100 MVM		3.29	3.27
Fatalities per Fatal Accident		1.13	1.13
Month with Highest Percentage		July	July
Day with Highest Percentage		Saturday	Saturday
Percent Alcohol Involved		27	23
Percent Drivers Wearing Safety Equipment		4.4	7.9
Percent Single Vehicle Accidents		61	58
Type of Roadway	Interstate	8.5	7.6
	Other US Route	16.4	28.6
	Other State Route	32.2	46.9
	County Road	16.1	6.9
	Local Street	19.7	5.7
	Other	6.3	4.3
Weather Conditions	Rain	9	12
	Snow or Ice	3	1
	Fog	2	3
Percent During Non-Daylight Hours		56	52

*All nationwide statistics and Kentucky fatal accident rates obtained from 1977, 1978, and fatal accident reporting system.

Table 17. Counties with Fatal Accident Rates Above Critical.

POPULATION CATEGORY	COUNTIES WITH FATAL ACCIDENT RATES ABOVE CRITICAL	NUMBER OF FATAL ACCIDENTS (1978-1979)	FATAL ACCIDENT RATE (ACCIDENTS PER 100 MVM)
under 10,000	Owsley	5	8.96
10,000-19,999	Leslie	15	8.94
	Monroe	11	7.94
	Knott	15	7.45
	McCreary	13	7.13
20,000-49,999	Perry	27	7.12
50,000-100,000	Warren	41	4.04

rates above critical were in the mountainous sections of Eastern Kentucky.

A list of cities with the highest fatal accident rates in each population category is presented in Table 18. Louisville and Lexington are the only cities contained in the largest population category. Although the fatal accident rates in these two cities are low compared to some other cities, the number of fatal accidents is high. Cities with the highest rates in the other population categories are Bowling Green, Henderson, Somerset, Harrodsburg, Providence, and Brandenburg.

Results from analyses of contributing factors for accidents involving various vehicle types, all accidents, and fatal accidents are in Table 12. The categories of unsafe speed and alcohol involvement were significantly overrepresented among fatal accidents. Less obvious overrepresentations among fatal accidents were noted relative to improper passing,

Table 18. Cities with High Fatal Accident Rates.*

POPULATION CATEGORY	CITY	NUMBER OF FATAL ACCIDENTS (1977-1979)	ANNUAL FATAL ACCIDENT RATE (ACCIDENTS PER 10,000 POP)
over 100,000	Louisville	247	1.7
30,000-99,999	Bowling Green	19	1.6
	Paducah	12	1.3
20,000-29,999	Henderson	18	2.4
	Hopkinsville	13	1.6
10,000-19,999	Somerset	9	2.3
	Elizabethtown	8	1.7
5,000-9,999	Harrodsburg	5	2.3
	Campbellsville	5	1.9
	Princeton	4	1.9
	Central City	3	1.9
	Lawrenceburg	3	1.9
	Williamsburg	3	1.8
	Independence	4	1.7
	Versailles	3	1.6
2,500-4,999	Providence	5	3.8
	Scottsville	4	3.2
	Grayson	3	2.9
1,000-2,499	Brandenburg	4	7.2
	Lebanon Junction	3	6.4
	Muldraugh	3	5.7

* There were no cities with fatal accident rates above critical.

disregard of traffic controls, tire failure, and defective shoulders.

Accident Statistics by Driver Age and Sex

Table 19 presents, for each county, a breakdown by sex and age group of all drivers involved in accidents. This table shows that over two-thirds of drivers involved in accidents in Kentucky in 1976 through 1978 were males. Approximately 18 percent of accident-involved drivers were 16 to 19 years of age, while about five percent were 65 or older, and nearly 13 percent were 16- to 19-year-old males.

Table 20 lists, by population category, counties that had the highest accident involvement percentages for each of the driver age and sex categories in Table 19. For male drivers, Leslie and Breathitt Counties had the highest percentages; Calloway County had the highest percentage for females. Letcher and Pendleton Counties had the highest percentages of 16- to 19-year-old drivers; Robertson and Pendleton Counties had the highest percentages of drivers 65 and older. For 16- to 19-year-old males, Fulton County had the state's highest percentage.

In a previous report (2), it was noted that the statewide accident rate (accidents per million vehicle-miles) was higher for female drivers than for males (8.56 to 7.45). The rate was extremely

Table 19. Accident Involvement by County by Driver Age and Sex.

	PERCENTAGE OF DRIVERS						PERCENTAGE OF DRIVERS				
COUNTY	MALE	FEMALE	16-19 MALES	16-19	65 AND OLDER	COUNTY	MALE	FEMALE	16-19 MALES	16-19	65 AND OLDER
Adair	72.3	27.7	14.7	19.5	9.2	Larue	74.3	25.7	15.6	21.3	8.5
Allen	72.8	27.2	15.5	21.5	8.4	Laurel	71.9	28.1	11.9	17.1	5.9
Anderson	69.2	30.8	14.6	20.5	6.0	Lawrence	78.6	21.4	10.2	14.1	5.7
Ballard	71.3	28.7	15.1	20.7	8.8	Lee	75.2	24.8	12.2	17.1	7.1
Barren	66.6	33.4	13.6	20.3	8.4	Leslie	82.5	17.5	12.2	14.6	3.7
Bath	74.6	25.4	14.3	19.7	4.5	Letcher	76.9	23.1	21.5	14.3	4.8
Bell	71.9	28.1	11.3	15.5	6.0	Lewis	73.5	26.5	14.5	19.8	5.6
Boone	68.1	31.9	14.6	20.8	4.1	Lincoln	73.2	26.8	13.9	17.8	8.3
Bourbon	70.0	30.0	14.0	19.2	6.7	Livingston	72.9	27.1	17.1	22.6	7.0
Boyd	67.5	32.5	12.8	18.5	6.0	Logan	71.0	29.0	15.9	21.5	8.3
Boyle	65.2	34.8	14.0	20.2	7.3	Lyon	75.7	24.3	10.7	15.5	8.7
Bracken	76.8	23.2	18.9	23.2	4.2	McCracken	64.4	35.6	12.6	18.0	8.5
Breathitt	82.5	17.5	12.3	15.2	3.2	McCreary	74.7	25.3	13.3	17.7	5.5
Breckenridge	73.3	26.7	16.8	22.3	8.6	McLean	71.5	28.5	17.5	24.7	8.0
Bullitt	72.6	27.4	17.0	22.7	4.0	Madison	68.2	31.8	12.5	18.6	4.7
Butler	75.0	25.0	14.2	20.1	5.6	Magoffin	77.2	22.8	12.6	16.9	3.4
Caldwell	69.2	30.8	12.9	18.8	11.5	Marion	72.6	27.4	15.9	21.0	7.1
Calloway	63.1	36.9	15.5	23.3	8.2	Marshall	71.5	28.5	16.1	22.1	4.1
Campbell	70.4	29.6	14.9	20.5	5.0	Martin	81.2	18.8	14.6	18.3	2.1
Carlisle	74.4	25.6	16.4	23.1	9.5	Mason	70.6	29.4	11.5	15.6	7.4
Carroll	73.4	26.6	13.4	17.6	6.0	Meade	75.5	24.5	15.8	22.0	3.6
Carter	71.8	28.2	16.0	21.6	4.2	Menifee	75.4	24.6	15.6	18.3	7.5
Casey	74.9	25.1	12.4	18.2	7.0	Mercer	66.4	33.6	14.7	20.5	8.4
Christian	67.9	32.1	12.6	17.9	7.0	Metcalfe	79.7	20.3	17.7	21.3	8.4
Clark	66.4	33.6	13.0	19.0	5.8	Monroe	73.8	26.2	15.4	20.5	10.1
Clay	75.4	24.6	12.1	16.5	5.1	Montgomery	69.8	30.2	13.0	18.6	6.7
Clinton	74.2	25.8	14.3	21.0	8.5	Morgan	77.4	22.6	14.2	18.3	4.5
Crittenden	67.1	32.9	15.4	23.3	9.5	Muhlenberg	71.6	28.4	14.9	21.1	7.3
Cumberland	67.7	32.3	10.8	16.2	9.9	Nelson	69.8	30.2	17.9	24.6	4.7
Daviess	65.6	34.4	14.9	21.7	6.3	Nicholas	75.5	24.5	17.9	21.3	5.8
Edmonson	75.2	24.8	15.6	21.3	5.5	Ohio	73.2	26.8	16.3	21.9	6.1
Elliott	81.7	18.3	13.2	15.5	5.2	Oldham	71.5	28.5	16.5	21.9	4.5
Estill	67.7	32.3	13.3	19.7	7.8	Owen	72.4	27.6	15.7	22.1	8.3
Fayette	66.6	33.4	10.6	15.3	4.4	Owsley	77.0	23.0	14.0	16.4	8.2
Fleming	72.0	28.0	12.5	16.8	7.5	Pendleton	76.6	23.4	20.5	26.6	6.7
Floyd	73.7	26.3	12.2	16.7	5.0	Perry	74.5	25.5	11.2	15.3	3.9
Franklin	64.5	35.5	10.8	15.9	5.9	Pike	75.4	24.6	12.1	15.6	3.9
Fulton	66.2	33.8	10.3	15.9	13.0	Powell	73.5	26.5	13.7	18.7	4.3
Gallatin	81.4	18.6	15.3	19.4	4.9	Pulaski	68.7	31.3	13.1	19.0	7.4
Garrard	71.0	29.0	12.4	17.4	7.7	Robertson	67.6	32.4	18.9	27.9	9.0
Grant	74.9	25.1	16.8	22.3	6.5	Rockcastle	75.8	24.2	12.3	16.1	7.3
Graves	66.0	34.0	13.5	18.8	11.5	Rowan	67.4	32.6	12.7	20.1	5.2
Grayson	70.6	29.4	15.6	20.9	6.4	Russell	72.5	27.5	15.0	20.7	6.8
Green	72.4	27.6	12.7	18.5	10.1	Scott	69.5	30.5	12.6	18.1	5.7
Greenup	66.9	33.1	14.8	20.8	4.8	Shelby	68.3	31.7	13.9	19.6	6.9
Hancock	77.9	22.1	16.2	21.1	6.3	Simpson	67.9	32.1	13.4	19.3	7.5
Hardin	69.7	30.3	13.2	18.9	4.5	Spencer	77.3	22.7	13.8	18.4	6.7
Harlan	74.2	25.8	11.6	15.4	5.7	Taylor	68.1	31.9	13.4	20.1	6.4
Harrison	70.1	29.9	15.6	21.1	9.1	Todd	73.3	26.7	14.7	20.6	8.9
Hart	74.0	26.0	13.3	18.3	8.6	Trigg	76.1	23.9	15.2	19.0	9.9
Henderson	67.9	32.1	14.1	20.7	6.8	Trimble	70.2	29.8	13.6	21.8	6.4
Henry	75.1	24.9	14.9	19.0	6.4	Union	69.0	31.0	15.3	21.9	7.2
Hickman	74.7	25.3	15.7	20.6	10.0	Warren	65.5	34.5	12.6	19.5	6.0
Hopkins	67.2	32.8	13.6	20.1	6.9	Washington	73.0	27.0	16.3	21.1	7.7
Jackson	77.1	22.9	12.4	16.8	7.2	Wayne	68.7	31.3	13.2	19.2	8.2
Jefferson	68.2	31.8	11.5	16.3	4.5	Webster	73.8	26.2	13.0	16.3	8.5
Jessamine	69.9	30.1	13.8	19.7	5.2	Whitley	69.6	30.4	12.1	17.4	7.4
Johnson	74.6	25.4	12.5	17.4	4.7	Wolfe	75.1	24.9	11.0	15.2	6.5
Kenton	69.4	30.6	13.4	18.5	4.6	Woodford	68.1	31.9	14.1	20.2	5.0
Knott	76.7	23.3	13.6	17.9	3.4						
Knox	71.4	28.6	10.5	14.5	6.9	TOTAL	69.1	30.9	12.6	17.8	5.5

high for 16- to 19-year-old males (19.18) and only slightly lower for all 16- to 19-year old drivers (17.75). The rate for drivers 65 and older (8.97) was also higher than the overall rate (7.89). The accident trend analysis (Table 14) showed that the number of accidents involving drivers under 25 has decreased slightly, as did total accidents.

Another report (5) found that the differences in types of accidents by sex of driver were similar to the differences by age of driver. Male and young drivers were involved in a higher percentage of single-vehicle, fixed-object, and head-on accidents but a lower percentage of angle and rear-end accidents. To illustrate the largest difference, male drivers under 25 were compared to female drivers 50 years of age and older. Males under 25 were involved in a much higher percentage of single-vehicle and fixed-object accidents -- which indicates speeding. Female drivers 50 years old and older were involved in a higher percentage of rear-end and angle accidents -- which suggests driver inattention. Considering all accidents, driver inattention and failure to yield were the most frequent causes. Male and young drivers were listed as speeding most frequently. Alcohol involvement was highest among middle-aged drivers (25 to 49 years old). Failure to yield was listed more often for female and older drivers. It was also found that female and middle-aged drivers were not at fault in a higher percentage of instances than the other categories of drivers. There, too, the contributing factors for fatal accidents were found to be different than for all accidents. Speeding was the most frequent cause of fatal accidents for both males and females. However, failure to yield was the most frequent cause of fatal accidents among drivers 50 years of age or older. Alcohol involvement was the second leading contributing factor for males and was highest for middle-aged drivers. Failure to yield was the second leading contributing factor among females. A comparison of males under 25 with females 50 years old and older illustrates the large differences. For males under 25, the leading factors were speeding and alcohol involvement. For females over 50, the leading factors were failure to yield and disregarding traffic controls. Only a very slight difference in the overall nighttime accident rates was found for males compared to females. As with the

Table 20. Counties with Highest Accident Involvement by Driver Age and Sex.

DRIVER CATEGORY	COUNTY POPULATION CATEGORY	COUNTIES WITH HIGHEST ACCIDENT INVOLVEMENT FOR GIVEN DRIVER CATEGORY	PERCENT OF ACCIDENT-INVOLVED DRIVERS IN GIVEN CATEGORY
Male	Under 10,000	Elliott	81.7
		Gallatin	81.4
		Metcalfe	79.7
	10,000 -19,999	Leslie	82.5
		Breathitt	82.5
		Martin	81.2
	20,000 -49,999	Letcher	76.9
		Meade	75.5
		Clay	75.4
	50,000 -100,000	Pike	75.4
	Over 100,000	Kenton	69.4
Female	Under 10,000	Fulton	33.8
		Crittenden	32.9
		Robertson	32.4
		Cumberland	32.3
	10,000 -19,999	Mercer	33.6
		Rowan	32.6
	20,000 -49,999	Calloway	36.9
		Franklin	35.5
		Boyle	34.8
	50,000 -100,000	McCracken	35.6
		Warren	34.5
		Daviess	34.4
	Over 100,000	Fayette	33.4
16-19 Years	Under 10,000	Robertson	18.9
		Bracken	18.9
		Nicholas	17.9
		Metcalfe	17.7
	10,000 -19,999	Pendleton	20.5
		McLean	17.5
	20,000 -49,999	Letcher	21.5
		Nelson	17.9
		Bullitt	17.0
	50,000 -100,000	Campbell	14.9
		Daviess	14.9
	Over 100,000	Kenton	13.4
65 and Older	Under 10,000	Robertson	27.9
		Crittenden	23.3
		Bracken	23.2
		Carlisle	23.1
	10,000 -19,999	Pendleton	26.6
		McLean	24.7
	20,000 -49,999	Nelson	24.6
		Calloway	23.3
		Bullitt	22.7
	50,000 - 100,000	Daviess	21.7
		Campbell	20.5
	Over 100,000	Kenton	18.5
16-19 Males	Under 10,000	Fulton	13.0
		Hickman	10.0
		Trigg	9.9
		Cumberland	9.9
	10,000 -19,999	Caldwell	11.5
		Green	10.1
		Monroe	10.1
	20,000 -49,999	Graves	11.5
		Barren	8.4
		Logan	8.3
		Calloway	8.2
	50,000 -100,000	McCracken	8.5
		Christian	7.0
	Over 100,000	Kenton	4.6

other rates, the highest rate was for teenage drivers. The lowest rate was for drivers in the 40- to 49-year-old category. The rate increased for older drivers. In fact, the highest rate was for females 70 years of age or older.

Table 21. Summary of Driver Records by County (1/1/78 through 12/31/80).

COUNTY	NUMBER OF DRIVERS SUSPENDED	NUMBER OF DRIVERS ON PROBATION	NUMBER OF SPEEDING VIOLATIONS	NUMBER OF RECKLESS DRIVING VIOLATIONS	NUMBER OF STOP VIOLATIONS	NUMBER OF ALCOHOL VIOLATIONS	TOTAL NUMBER OF VIOLATIONS	TOTAL NUMBER OF POINTS ACCUMULATED
Adair	362	30	878	146	48	109	1,583	3,589
Allen	262	18	591	83	62	101	1,061	2,709
Anderson	251	33	1,162	166	103	138	1,978	4,730
Ballard	217	29	854	93	112	102	1,399	3,930
Barren	940	47	2,568	366	178	489	4,605	9,384
Bath	186	19	643	144	52	95	1,153	2,347
Bell	1,056	48	2,449	177	199	293	4,518	10,360
Boone	964	208	6,333	514	799	527	9,600	25,288
Bourbon	392	63	1,935	296	292	218	3,349	8,851
Boyd	1,131	146	4,886	469	1,074	450	8,277	22,660
Boyle	641	77	2,479	207	269	314	4,031	10,209
Bracken	94	15	510	111	53	52	883	2,401
Breathitt	317	16	760	87	44	82	1,339	2,602
Breckinridge	247	32	1,148	182	108	127	1,890	5,252
Bullitt	497	55	2,571	456	1,155	233	4,816	12,438
Butler	256	29	909	200	54	119	1,578	3,516
Caldwell	362	27	1,236	138	141	156	2,113	4,863
Calloway	546	61	2,893	438	327	137	4,675	12,572
Campbell	1,752	291	10,514	1,044	2,218	948	17,200	44,379
Carlisle	71	13	424	43	52	39	648	1,910
Carroll	287	28	833	86	124	42	1,466	3,456
Carter	551	67	1,867	280	169	173	3,431	7,482
Casey	405	35	887	157	64	172	1,837	4,219
Christian	2,025	149	6,111	638	1,050	471	9,975	24,957
Clark	686	76	2,671	331	319	326	4,600	11,186
Clay	654	25	1,280	292	83	134	2,511	4,577
Clinton	217	18	697	99	23	165	1,238	2,867
Crittenden	235	33	1,167	113	73	105	1,789	4,880
Cumberland	173	14	519	109	18	60	916	2,183
Daviess	1,685	179	10,420	813	1,607	1,163	16,139	37,609
Edmonson	155	18	513	87	61	88	960	2,319
Elliott	137	11	416	71	29	41	803	1,782
Estill	343	17	990	142	123	164	1,821	4,275
Fayette	6,472	779	29,539	2,587	7,215	1,358	51,508	129,711
Fleming	170	29	896	133	82	108	1,490	4,065
Floyd	906	59	2,220	212	91	219	3,931	8,136
Franklin	1,181	114	4,957	638	753	679	8,673	20,258
Fulton	234	17	607	70	90	99	1,132	2,926
Gallatin	100	10	441	36	32	37	679	2,305
Garrard	224	22	748	113	97	111	1,370	3,275
Grant	304	31	1,191	146	94	117	1,926	4,434
Graves	656	50	2,544	525	336	218	4,466	11,491
Grayson	376	56	1,358	270	113	225	2,497	6,123
Green	149	22	652	142	34	43	1,044	2,831
Greenup	867	100	3,778	446	532	211	5,918	17,067
Hancock	118	15	699	59	64	77	1,049	2,685
Hardin	2,536	210	6,379	567	1,002	626	10,784	27,295
Harlan	1,332	119	3,670	428	249	386	6,689	17,284
Harrison	297	33	1,191	147	130	155	1,949	4,992
Hart	355	15	924	146	72	176	1,701	3,652
Henderson	1,174	147	4,890	587	956	544	8,431	19,641
Henry	244	24	989	112	104	84	1,568	3,583
Hickman	126	16	506	47	53	63	814	2,198
Hopkins	1,547	149	5,708	574	547	499	9,434	20,453
Jackson	283	6	443	162	72	75	1,071	2,227
Jefferson	18,790	1,837	70,789	12,005	25,247	3,927	138,950	365,457
Jessamine	549	59	234	247	490	227	4,003	10,001
Johnson	556	54	1,717	220	114	162	3,135	7,479
Kenton	3,291	415	13,352	1,687	3,283	1,498	24,077	60,666
Knott	276	13	456	62	30	56	921	2,025
Knox	934	68	2,728	233	139	280	4,547	10,488
Larue	201	16	781	91	67	93	1,290	3,088
Laurel	1,226	94	2,941	291	202	373	5,354	10,661
Lawrence	282	35	933	121	67	110	1,674	4,247
Lee	209	11	425	63	54	138	996	1,886
Leslie	305	11	735	125	59	76	1,404	2,532
Letcher	667	29	1,528	200	86	227	2,827	6,578
Lewis	209	29	792	120	54	93	1,378	3,780
Lincoln	489	40	1,378	172	122	197	2,444	5,975
Livingston	250	37	1,201	162	71	105	1,961	5,173
Logan	425	40	1,437	560	129	135	2,650	7,675
Lyon	117	15	514	107	38	45	847	2,166
McCracken	2,137	163	6,476	717	1,454	589	11,474	28,576
McCreary	397	22	1,006	99	60	149	1,848	3,556
McLean	152	21	1,321	89	88	108	1,853	5,053
Madison	1,574	133	4,629	493	804	632	8,403	18,650
Magoffin	380	23	929	211	34	80	1,836	3,977
Marion	212	20	1,014	325	113	86	1,847	5,184
Marshall	519	69	3,020	399	237	191	4,671	11,541
Martin	255	16	683	152	57	124	1,339	3,457
Mason	278	29	1,067	193	122	93	1,883	5,227
Meade	298	27	978	164	180	121	1,855	4,861
Menifee	99	8	222	70	16	55	524	1,135
Mercer	513	46	1,940	172	178	300	3,237	7,573
Metcalfe	196	11	537	99	26	79	969	2,046
Monroe	183	9	424	140	32	88	878	1,994
Montgomery	461	47	1,533	322	138	246	2,865	5,908
Morgan	252	12	535	121	35	68	1,101	2,330
Muhlenburg	716	54	2,582	314	161	234	4,176	10,239
Nelson	414	52	2,386	333	332	283	3,937	10,361
Nicholas	149	17	563	77	35	101	1,002	2,536
Ohio	456	39	1,874	205	138	203	2,962	6,900
Oldham	348	63	2,620	169	356	85	3,752	8,892
Owen	126	20	572	68	69	88	1,010	2,485
Owsley	137	1	247	55	27	94	610	1,205
Pendleton	165	22	1,184	180	133	86	1,846	5,089
Perry	789	40	2,131	268	143	269	3,706	7,828
Pike	1,440	87	2,336	718	367	313	7,286	18,281
Powell	255	14	749	112	47	91	1,320	2,441
Pulaski	1,164	123	4,006	431	424	525	6,803	16,662
Robertson	27	1	105	22	12	15	195	493
Rockcastle	312	30	995	136	87	176	1,778	3,666
Rowan	639	51	1,599	163	193	251	2,998	6,140
Russell	377	15	794	105	61	156	1,487	3,153
Scott	572	53	1,982	298	382	176	3,593	8,667
Shelby	606	36	2,294	281	321	211	3,332	8,792
Simpson	395	45	1,181	144	104	116	1,858	5,061
Spencer	122	12	452	88	96	60	839	2,221
Taylor	408	36	1,609	333	110	66	2,498	6,672
Todd	286	30	918	239	68	56	1,528	4,449
Trigg	141	23	891	93	62	86	1,356	3,610
Trimble	72	13	392	25	36	29	580	1,461
Union	572	74	1,765	221	226	155	3,104	8,366
Warren	2,197	117	7,151	1,245	907	606	12,148	28,600
Washington	115	19	894	155	86	62	1,397	3,939
Wayne	288	19	1,048	148	69	160	1,765	4,355
Webster	361	64	1,682	191	137	136	2,710	6,139
Whitley	984	65	1,686	133	97	243	3,007	6,109
Wolfe	189	11	477	72	21	44	498	1,519
Woodford	418	44	1,722	192	242	190	2,927	7,412

Table 22. Violation, Point Accumulation, and Suspension Rates by County (1978 through 1980).

	TOTAL POINTS PER 1,000 LICENSED DRIVERS	ALCOHOL VIOLATIONS PER 1,000 LICENSED DRIVERS	SPEED VIOLATIONS PER 1,000 LICENSED DRIVERS	SUSPENSIONS PER 1,000 LICENSED DRIVERS	TOTAL VIOLATIONS PER 1,000 LICENSED DRIVERS
Adair	472	14.3	115.6	47.6	208
Allen	351	13.1	76.6	34.0	137
Anderson	662	19.3	162.5	35.1	277
Ballard	732	19.0	159.1	40.4	261
Barren	498	25.9	136.2	49.9	244
Bath	443	17.9	121.3	36.1	217
Bell	701	19.8	165.8	71.5	305
Boone	1,018	21.2	255.0	58.8	536
Bourbon	823	20.3	190.0	56.5	311
Boyd	689	15.7	143.6	35.4	252
Boyle	717	22.0	174.0	55.0	286
Bracken	561	12.2	119.3	22.0	206
Breathitt	376	11.9	110.4	46.0	194
Breckinridge	568	13.7	124.1	26.7	204
Bullitt	593	11.2	122.5	23.7	229
Butler	606	20.5	156.8	44.2	272
Caldwell	550	18.6	147.4	43.2	252
Calloway	759	18.3	179.8	33.0	282
Campbell	969	20.7	229.5	38.2	375
Carlisle	534	10.9	118.5	19.8	181
Carroll	664	8.1	169.1	55.2	282
Carter	630	14.6	157.3	46.4	289
Casey	544	22.2	114.4	52.3	237
Christian	857	16.7	217.2	72.0	354
Clark	711	20.7	169.8	43.6	295
Clay	505	14.8	141.2	72.1	277
Clinton	601	34.6	146.0	55.5	259
Crittenden	839	18.7	207.8	41.5	318
Cumberland	571	15.7	135.7	45.2	239
Daviess	720	22.3	198.6	32.3	309
Edmonson	413	15.7	91.3	27.6	171
Elliott	566	13.0	132.5	43.5	255
Estill	559	21.4	129.4	48.8	239
Fayette	1,285	13.2	238.1	63.1	502
Fleming	643	17.1	181.7	25.9	236
Floyd	399	10.7	108.8	84.4	192
Franklin	837	28.1	204.8	68.8	358
Fulton	544	18.4	112.9	43.5	211
Gallatin	585	14.2	169.3	38.4	261
Garrard	536	10.2	122.5	36.7	224
Grant	579	15.3	155.6	39.7	252
Graves	551	18.5	122.1	39.5	214
Grayson	556	20.3	123.4	34.2	227
Green	459	7.0	105.8	24.2	169
Greenup	815	19.1	180.5	41.4	283
Hancock	599	17.2	155.9	26.3	235
Hardin	733	13.0	145.4	72.8	335
Harlan	672	19.5	165.1	67.2	337
Harrison	544	16.9	129.7	32.5	212
Hart	498	20.6	108.4	41.6	199
Henderson	806	22.3	200.6	48.2	306
Henry	494	11.7	137.5	33.9	218
Hickman	575	16.5	132.5	33.0	213
Hopkins	774	18.9	218.1	58.6	357
Jackson	417	14.0	82.9	53.0	200
Jefferson	970	10.4	187.8	49.9	369
Jessamine	782	17.7	198.0	42.9	313
Johnson	645	13.1	142.2	48.0	270
Kenton	851	21.0	187.3	46.2	338
Knott	264	7.3	59.5	36.0	120
Knox	463	21.4	208.9	71.5	343
Larue	459	13.2	111.0	28.6	183
Laurel	572	20.0	157.9	65.8	287
Lawrence	632	17.7	149.9	45.3	269
Lee	518	37.6	115.9	57.0	272
Leslie	435	13.1	126.3	53.8	241
Letcher	464	16.0	107.9	57.1	200
Lewis	543	13.4	119.9	30.1	198
Lincoln	610	20.1	140.8	50.0	250
Livingston	960	19.5	222.8	46.4	364
Logan	503	10.0	106.3	31.5	196
Lyon	631	13.1	149.8	34.1	267
McCracken	713	14.7	161.5	53.3	286
McCreary	538	22.6	152.3	60.1	280
McLean	308	17.3	211.6	24.3	296
Madison	789	26.7	195.5	66.5	355
Magoffin	630	10.4	151.3	65.0	319
Marion	550	9.1	107.7	22.5	196
Marshall	717	11.9	187.7	33.3	290
Martin	586	21.0	115.7	43.2	227
Mason	543	9.7	110.7	28.9	195
Meade	557	13.9	112.1	34.2	213
Menifee	442	21.4	86.5	38.9	204
Mercer	674	26.7	172.6	45.6	288
Metcalfe	435	16.8	114.2	33.2	206
Monroe	305	13.5	64.9	28.0	130
Montgomery	548	24.3	151.5	48.6	283
Morgan	412	12.0	94.5	56.3	194
Muhlenburg	554	12.7	139.8	38.5	228
Nelson	677	13.6	155.8	27.0	257
Nicholas	748	29.7	195.5	43.9	295
Ohio	562	16.5	152.6	37.1	241
Oldham	746	7.1	219.7	29.2	315
Owen	563	19.2	126.0	27.5	221
Owsley	481	37.5	93.6	54.7	248
Pendleton	537	14.2	184.8	27.1	304
Perry	520	17.9	149.7	52.5	246
Pike	502	8.6	64.1	39.5	200
Powell	449	16.7	137.8	46.9	243
Pulaski	696	21.9	164.7	46.7	284
Robertson	368	11.7	81.3	21.0	152
Rockcastle	523	25.0	141.5	45.5	253
Rowan	758	32.8	195.3	58.4	368
Russell	695	20.0	153.1	33.2	276
Scott	750	15.2	171.8	59.5	311
Shelby	726	17.6	193.5	50.1	316
Simpson	539	13.5	137.5	46.0	216
Spencer	554	16.1	115.6	32.7	224
Taylor	580	5.7	139.9	35.5	217
Todd	719	9.1	163.4	46.3	247
Trigg	691	14.8	159.2	28.3	223
Trimble	395	7.8	105.9	19.5	157
Union	789	14.5	162.2	52.6	285
Warren	767	16.3	191.8	58.9	326
Washington	629	9.9	142.8	18.4	223
Wayne	519	19.1	134.9	34.3	210
Webster	699	15.5	191.8	41.1	306
Whitley	430	17.4	129.8	70.5	215
Wolfe	473	13.7	152.5	58.8	155
Woodford	714	13.3	169.0	40.3	232
STATE AVERAGE	763	15.7	171.3	46.9	306

Driver Records

A summary of selected information was obtained from the master driver license file maintained by the Division of Driver Licensing (Table 21). The number of citations issued in a three-year period (1978-1980) was tabulated by county. Also, the numbers of speeding, reckless driving, stop-related, and alcohol-related citations were listed. The number of demerits (points) for specific violations accumulated in the three-year period was given. Also, the number of drivers suspended or placed on probation was summarized. Using the numbers given in Table 21 along with the number of licensed drivers in each county, violation, point, and suspension rates were calculated by county (Table 22). Rates, given in terms of 1,000 licensed drivers, were calculated for total points, alcohol-related violations, speed violations, suspensions, and total violations. These rates were summarized by county population groups (Table 23). The rates for total points, speed violations, suspensions, and total violations increased as county population increased. However, the rate for alcohol violations decreased as county population increased. It was found that the percentages of accidents involving speeding and alcohol increased as the county population decreased.

Counties with the highest and lowest violation, point accumulation, and suspension rates are given in Tables 24 and 25, respectively. The high and the low ten percent of the counties (12 counties) were listed. A comparison of the driver record data with the accident rate data provides information about the need for increased enforcement in a particular county. The total violation rates for counties with an accident rate above critical were analyzed to determine where increased police enforcement was warranted. Counties with accident rates above critical should also have above-

Table 23. Violation, Point Accumulation, and Suspension Rates by County Population Group (1978 through 1980).

POPULATION GROUP	LICENSED DRIVERS	TOTAL POINTS PER 1,000 LICENSED DRIVERS	ALCOHOL VIOLATIONS PER 1,000 LICENSED DRIVERS	SPEED VIOLATIONS PER 1,000 LICENSED DRIVERS	SUSPENSIONS PER 1,000 LICENSED DRIVERS	PERCENT OF ACCIDENTS INVOLVING SPEEDING	PERCENT OF ACCIDENTS INVOLVING ALCOHOL	TOTAL VIOLATIONS PER 1,000 LICENSED DRIVERS
Under 10,000	94,368	634	19.2	148.8	40.0	15.8	7.1	254
10,000 - 19,999	353,500	566	16.4	134.1	40.8	22.5	10.0	234
20,000 - 29,999	565,423	690	17.4	165.4	47.1	11.8	7.0	288
50,000 - 100,000	355,074	707	16.3	165.9	46.4	7.9	6.4	286
Over 100,000	550,698	1,009	12.3	206.4	51.8	6.0	5.5	390

Table 24. Counties with Highest Violation, Point Accumulation, and Suspension Rates (1978 through 1980).

COUNTY	TOTAL POINTS PER 1,000 LICENSED DRIVERS	COUNTY	ALCOHOL VIOLATIONS PER 1,000 LICENSED DRIVERS	COUNTY	SPEED VIOLATIONS PER 1,000 LICENSED DRIVERS	COUNTY	SUSPENSIONS PER 1,000 LICENSED DRIVERS	COUNTY	TOTAL VIOLATIONS PER 1,000 LICENSED DRIVERS
Fayette	1265	Lee	37.63	Fayette	288.1	Rowan	78.44	Fayette	502
Boone	1018	Owsley	37.51	Boone	255.0	Hardin	72.76	Boone	386
Jefferson	970	Clinton	34.57	Campbell	229.5	Clay	72.14	Campbell	375
Campbell	969	Rowan	30.81	Livingston	222.8	Christian	71.96	Jefferson	369
Livingston	960	Nicholas	29.73	Oldham	219.7	Knox	71.52	Rowan	368
Christian	887	Franklin	28.05	Christian	217.2	Whitley	70.50	Livingston	364
Gallatin	885	Madison	26.69	Hopkins	216.1	Harlan	67.19	Franklin	358
Harlan	872	Mercer	26.69	McLean	211.3	Madison	66.48	Hopkins	357
Kenton	851	Barren	25.93	Knox	208.9	Magoffin	65.97	Madison	355
Franklin	837	Rockcastle	24.95	Crittenden	207.8	Laurel	65.81	Christian	354
Pendleton	837	Montgomery	24.31	Franklin	204.8	Fayette	63.13	Knox	348
Greenup	815	McCreary	22.55	Henderson	200.6	McCreary	60.08	Henderson	346

Table 25. Counties with Lowest Violation, Point Accumulation, and Suspension Rates (1978 through 1980).

COUNTY	TOTAL POINTS PER 1,000 LICENSED DRIVERS	COUNTY	ALCOHOL VIOLATIONS PER 1,000 LICENSED DRIVERS	COUNTY	SPEED VIOLATIONS PER 1,000 LICENSED DRIVERS	COUNTY	SUSPENSIONS PER 1,000 LICENSED DRIVERS	COUNTY	TOTAL VIOLATIONS PER 1,000 LICENSED DRIVERS
Knott	264	Taylor	5.74	Knott	59.5	Washington	18.36	Knott	120
Monroe	305	Green	6.97	Pike	64.1	Trimble	19.46	Monroe	130
Allen	351	Oldham	7.13	Monroe	64.9	Carlisle	19.43	Allen	137
Breathitt	378	Knott	7.31	Allen	76.6	Robertson	21.04	Robertson	152
Robertson	384	Trimble	7.84	Robertson	81.8	Bracken	21.98	Wolfe	155
Trimble	395	Carroll	8.07	Jackson	82.9	Marion	22.51	Trimble	157
Floyd	399	Pike	8.58	Menifee	86.5	Bullitt	23.68	Green	169
Morgan	412	Todd	9.06	Edmonson	91.3	Green	24.18	Edmonson	171
Edmonson	413	Mason	9.65	Morgan	94.5	Trigg	24.25	Carlisle	181
Hart	428	Washington	9.90	Green	105.8	McClean	24.31	Larue	183
Leslie	435	Logan	9.99	Trimble	105.9	Hancock	26.33	Breathitt	194
Metcalfe	435	Greenup	10.07	Logan	106.3	Breckinridge	26.69	Morgan	194

average violation rates. Five of the twelve counties with the highest total violation rates were found to have accident rates above critical. Conversely, counties with accident rates above critical should not have very low total violation rates, and none of the counties with the lowest total-violation rates had accident rates above critical.

An analysis of violation rates was made for counties with accident rates above critical as given in Table 3. The total violation rate for each such county was compared to the average total violation rate for its population category. Counties with violation rates below average were identified and are given in Table 26. More intense enforcement may be warranted in those counties.

The trend in total violations issued by county was investigated as shown in Table 27. The number of total violations issued in 1980 was compared to the average annual number of total violations issued over the three-year period from 1978 to 1980. There was a 10- percent increase statewide. There was a decrease in violations issued in only 20 counties. The change in 1980 for the counties identified in Table 26 was compared to the statewide 10-percent increase. The counties of Lewis (2.2 percent decrease), Marion (1.0 percent increase), and Trigg (5.7 percent increase) did not have increases in violations issued as large as the statewide average. Many of the counties identified in Table 26 had increases in violations substantially above the 10-percent state average.

Speed-Related Accidents

A listing, by county, of the percentages of accidents involving speeding is given in Table 11. These

Table 26. Counties with Total Accident Rates Above Critical and Total Violation Rates Below Average.*

POPULATION CATEGORY	COUNTY	NUMBER OF ACCIDENTS (1978-1979)	ACCIDENT RATE (ACCIDENTS PER 100 MVM)	TOTAL VIOLATIONS PER 1,000 LICENSED DRIVERS
Under 10,000	Trigg	779	420	233
10,000-19,999	Mason	2,185	872	195
	Marion	1,340	800	196
	Harrison	1,084	612	212
	Wayne	859	484	210
	Lewis	671	441	198
	Garrard	678	438	224
20,000-49,999	Boyd	2,223	676	286
	Perry	2,411	636	246
	Taylor	1,320	589	217
	Calloway	2,080	559	282
	Laurel	2,659	549	287
	Montgomery	1,338	549	283
50,000-100,000	Boyd	6,135	734	252
Over 100,000	Kenton	15,996	1,063	338

* Average total violation rates by population category are given in Table 23.

Table 27. Trend in Total Violations Issued by County.

COUNTY	AVERAGE NUMBER OF TOTAL VIOLATIONS ISSUED (1978 - 1980)	TOTAL VIOLATIONS ISSUED IN 1980	1980 PERCENT CHANGE
Adair	528	612	+15.9
Allen	354	354	0.0
Anderson	659	606	-8.0
Ballard	466	482	+3.4
Barren	1,535	1,585	+3.3
Bath	384	414	+7.8
Bell	1,506	1,873	+24.4
Boone	3,200	3,954	+23.6
Bourbon	1,116	1,168	+4.7
Boyd	2,759	3,441	+24.7
Boyle	1,360	1,449	+6.5
Bracken	294	334	+13.6
Breathitt	446	540	+21.1
Breckinridge	630	609	-3.3
Bullitt	1,605	1,768	+10.2
Butler	526	498	-5.3
Caldwell	704	742	+5.4
Calloway	1,558	1,789	+14.8
Campbell	5,733	5,060	-11.7
Carlisle	216	216	0.0
Carroll	489	507	+3.7
Carter	1,144	1,361	+19.0
Casey	612	670	+9.5
Christian	3,325	3,157	+5.1
Clark	1,533	1,824	+19.0
Clay	837	934	+11.6
Clinton	413	469	+13.6
Crittenden	596	551	+7.5
Cumberland	305	308	+1.0
Daviess	5,380	5,998	+11.5
Edmonson	320	339	+5.9
Elliott	268	342	+27.6
Estill	607	608	+0.2
Fayette	17,169	19,346	+12.7
Fleming	497	568	+14.3
Floyd	1,310	1,933	+47.6
Franklin	2,891	2,758	-4.6
Fulton	377	387	+2.6
Gallatin	226	242	+7.1
Garrard	457	502	+9.8
Grant	642	789	+22.9
Graves	1,489	1,581	+6.2
Grayson	832	897	+7.8
Green	348	421	+21.0
Greenup	1,973	2,248	+13.9
Hancock	350	426	+21.7
Hardin	3,595	3,728	+3.7
Harlan	2,230	3,020	+35.4
Harrison	659	800	+23.1
Hart	567	538	-5.1
Henderson	2,810	2,669	-5.0
Henry	523	562	+7.5
Hickman	271	232	-14.4
Hopkins	3,145	3,980	+26.6
Jackson	357	368	+3.1
Jefferson	46,317	49,652	+7.2
Jessamine	1,334	1,301	+2.5
Johnson	1,045	1,433	+37.1
Kenton	8,026	9,444	+17.7
Knott	307	361	+17.6
Knox	1,516	1,158	-23.6
Larue	430	441	+2.6
Laurel	1,785	2,057	+15.2
Lawrence	558	644	+15.4
Lee	332	321	-3.3
Leslie	468	648	+38.5
Letcher	942	1,125	+19.4
Lewis	459	449	-2.2
Lincoln	815	910	+11.7
Livingston	654	658	+0.6
Logan	883	877	-0.7
Lyon	282	284	+0.7
McCracken	3,825	4,057	+6.1
McCreary	616	771	+25.2
McLean	618	645	+4.4
Madison	2,801	2,792	-0.3
Magoffin	612	740	+20.9
Marion	616	622	+1.0
Marshall	1,557	1,660	+6.6
Martin	446	548	+22.9
Mason	628	720	+14.6
Meade	618	610	-1.3
Menifee	175	197	+12.6
Mercer	1,079	1,068	+1.0
Metcalfe	323	362	+12.1
Monroe	293	325	+10.9
Montgomery	955	1,133	+18.6
Morgan	367	535	+45.8
Muhlenburg	1,392	1,520	+9.2
Nelson	1,312	1,301	-0.8
Nicholas	334	367	+9.9
Ohio	987	1,062	+7.6
Oldham	1,251	1,383	+10.5
Owen	337	333	-1.2
Owsley	203	225	-10.8
Pendleton	615	638	+3.7
Perry	1,235	1,497	+21.2
Pike	2,429	3,515	+44.7
Powell	440	593	+34.8
Pulaski	2,268	2,756	+21.5
Robertson	65	67	+3.1
Rockcastle	593	575	-3.3
Rowan	999	1,031	+3.2
Russell	496	561	+13.1
Scott	1,198	1,516	+26.5
Shelby	1,278	1,306	+2.2
Simpson	619	559	-9.7
Spencer	280	284	+1.4
Taylor	833	932	+11.9
Todd	509	524	+2.9
Trigg	452	478	+5.7
Trimble	193	217	+12.4
Union	1,035	1,151	+11.2
Warren	4,049	3,860	-4.7
Washington	466	511	+9.7
Wayne	583	716	+21.8
Webster	903	1,007	+11.5
Whitley	1,002	1,761	+75.7
Wolfe	166	351	+73.3
Woodford	976	988	+1.2
ALL	194,935	214,695	+10.1

percentages were also calculated for cities with a population of 1,000 or more (Table 6). These tables were used to identify counties and cities having a large percentage of accidents involving speeding. Overall, 9.1 percent of all accidents involved unsafe speed. Some smaller counties and cities had very high percentages of accidents involving speeding. This could have resulted from the small sample of accidents.

A comparison of speed-related accidents and the incidence of speeding charges showed, in general, that the rate of these violations increased as the percentage of speed-related accidents decreased. For example, in six counties in the 10,000-to-19,999 population range where the speed violation rate was below 100 per 1,000 licensed drivers, an average of 22 percent of all accidents involved unsafe speed. The average percentage decreased to 13 percent in four counties where the citation rates were over 175 per 1,000 licensed drivers.

A listing of counties and cities that had the highest percentages of accidents involving speeding is given in Table 28.

Table 28. Counties and Cities with Large Percentages of Accidents Involving Speeding.

POPULATION CATEGORY	COUNTIES AND CITIES WITH HIGH RATES	NUMBER OF SPEED-RELATED ACCIDENTS (1977-1979)	PERCENTAGE OF ACCIDENTS INVOLVING SPEEDING
COUNTIES			
Under 10,000	Robertson*	28	31
	Menifee*	74	29
	Spencer*	95	26
10,000-19,999	Henry	306	31
	Knott*	247	30
	Leslie*	180	30
20,000-49,999	Letcher*	367	29
	Oldham	482	24
50,000-100,000	Pike*	932	15
	Hardin	1,038	14
	Madison	937	13
Over 100,000	Jefferson*	7,263	6.7
CITIES			
1,000-2,499	Guthrie	4	33
	Camargo	3	23
	Evarts	18	18
	Mortons Gap	8	18
2,500-4,999	Jenkins*	16	35
	Williamstown	44	17
	Scottsville*	56	15
5,000-9,999	Independence*	121	13
	Fort Mitchell*	82	7.4
10,000-19,999	Radcliff*	149	7.3
	Fort Thomas	103	6.0
20,000-29,999	Hopkinsville	261	4.9
30,000-100,000	Covington	446	3.6
Over 100,000	Louisville	6,440	6.4

* This county has a speed violation rate below the average for its population category, or this city is in such a county.

The list is classified by population category. A comparison of this list with the rate of citations for speed violations (Table 22) may identify locations with a low level of enforcement, given the high rate of accidents involving speeding. Counties with speed-violation rates below the average for their population categories and cities in counties with speed-violation rates below the average for their population categories were noted in Table 28. These counties and cities, in particular, may need increased enforcement. An example would be Pike County, which had a low rate of citations (64.1 speed violations per 1,000 licensed drivers) compared to an average for its population category of 165.9 speed violations per 1,000 licensed drivers (Table 23).

The list of counties with the lowest statewide speed-violation rates provides another ranking of counties potentially in need of increased speed enforcement (Table 25). Knott and Pike Counties had the lowest speed violation rates in the state and were also listed in Table 28 as having a high percentage of accidents involving speeding. The only county appearing on both the list of counties with high speed violation rates (Table 24) and the list of counties with high percentages of speed-related accidents was Oldham County.

The accident trend analysis given in Table 14 shows that the number of speed-related accidents has changed only slightly during the three-year study period. There has been a slight reduction in this type of accident.

Alcohol-Related Accidents

Summaries showed that 6.4 percent of all accidents and 23.5 percent of fatal accidents involved alcohol as a contributing factor. Alcohol was second only to unsafe speed as a contributing factor in fatal accidents.

The percentage of accidents involving alcohol is given by county in Table 11 and by city (with population of 1,000 or more) in Table 6. This percentage decreased as the county population increased (Table 23). Counties and cities with a large percentage of accidents involving alcohol are shown, by population category, in Table 29. Counties with alcohol-violation rates below the average for their population categories (as shown in Table 23) were identified. An example is Oldham County, which had a high percentage of alcohol-related accidents (Table 11) and one of the lowest alcohol-violation rates in the state (Table 25). Also, cities in counties with alcohol-violation rates below average were identified.

There are 26 counties in Kentucky in which alcohol is sold (wet counties) and another 10 counties in which one city sells alcohol. In these 36 counties, 6.2 percent of all accidents involved alcohol compared to 6.6 percent of accidents in dry counties. The lower percent resulted from the lower percent in the largest population category as shown in Table 23. When comparisons are made by population category, it is found that the percentage of accidents involving alcohol is greater in wet than dry counties for population categories from 20,000 to 100,000. A

Table 29. Counties and Cities with Large Percentages of Accidents Involving Alcohol.

POPULATION CATEGORY	COUNTIES AND CITIES WITH HIGH RATES	NUMBER OF ALCOHOL-RELATED ACCIDENTS (1977-1979)	PERCENTAGE OF ACCIDENTS INVOLVING ALCOHOL
COUNTIES			
Under 10,000	Spencer*	50	14.0
	Metcalfe*	52	13.0
	Menifee	34	13.0
	Bath*	65	13.0
10,000-19,999	McCreary	90	13.0
	Russell	66	12.0
20,000-49,999	Meade*	237	13.0
	Harlan	361	10.0
	Nelson	274	9.5
	Oldham*	179	8.8
50,000-100,000	Madison	582	7.9
	Hardin	572	7.4
	McCracken*	669	7.3
	Christian	528	7.2
	Warren*	934	7.1
Over 100,000	Fayette	2,548	7.0
	Kenton	1,752	7.0
CITIES			
1,000-2,499	Augusta*	12	14.0
	Muldraugh*	45	13.0
	Uniontown*	5	13.0
2,500-4,999	Jenkins*	5	11.0
	Cumberland	18	8.6
5,000-9,999	Dayton	54	8.3
	Lebanon*	76	7.1
	Paris	70	6.6
10,000-19,999	Fort Thomas	133	7.8
	Radcliff	126	6.2
	Erlanger	193	5.8
	Winchester	150	5.5
20,000-29,999	Richmond	255	6.0
	Henderson	273	5.1
	Hopkinsville	264	5.0
30,000-100,000	Covington	996	8.0
Over 100,000	Lexington	2,468	6.9

* This county has an alcohol violation rate below the average for its population category, or this city is in such a county.

Table 30. Comparison of Alcohol-Related Accidents and Alcohol Violations for Wet and Dry Counties.

COUNTY POPULATION CATEGORY	PERCENT ALCOHOL RELATED ACCIDENTS		ALCOHOL VIOLATIONS PER 1,000 DRIVERS	
	WET COUNTIES*	DRY COUNTIES	WET COUNTIES	DRY COUNTIES
Under 10,000	8.2	8.2	13.2	19.2
10,000 - 19,999	7.6	7.6	14.5	17.2
20,000 - 49,999	7.6	6.3	19.9	15.4
50,000 - 100,000	6.6	5.5	19.4	13.3
Over 100,000	5.5	**	12.3	**

* Includes 26 counties in which alcohol is sold and 10 counties which have a city in which alcohol is sold.

** All three counties in this population category allow the sale of alcohol.

similar comparison was done for alcohol-violation rate. As shown in Table 30, the violation rate was higher in dry counties with populations under 20,000 and higher in wet counties with populations between 20,000 and 100,000. The overall violation rate in wet counties (15.4) was slightly below that for dry counties (16.1) because of the low rate in the wet counties with over 100,000 population.

Counties and cities having high percentages of alcohol-related accidents were identified in Table 29. Nine of the 17 counties and 15 of the 17 cities listed there allowed the sale of alcohol. Of the 186 cities given in Table 6 with a population of 1,000 of more, 75 (40.3 percent) are wet. Of the 48 cities with populations of 1,000 or more identified in Table 8 as having critical accident rates, 22 (45.8 percent) are wet.

As shown in Table 14, the number of alcohol-related accidents increased by 6.7 percent in 1979 compared to the three-year study period (1977-1979). The percentage of all accidents that were alcohol-related also increased in 1979.

Drug-Related Accidents

Drugs were listed as a contributing factor in only 0.3 percent of all accidents and 0.4 percent of fatal accidents (Table 12). Eight fatal accidents in the three-year study period were identified as being drug-related. The largest drug involvement was in train-related accidents (0.5 percent). The percentage of accidents involving drugs in each county was determined (Table 11). The highest percent involvement in any county was one percent (Hickman and Monroe Counties). The accident trend analysis did show an increase in drug-related accidents (Table 14). Drug-related accidents increased 17.1 percent in 1979 compared to the three-year average from 1977 to 1979.

License Restrictions and Handicapped Drivers

Data in Table 31 indicate that drivers with license restrictions are not overrepresented in accidents when compared to all drivers. Approximately 16 percent of all drivers have a license restriction whereas only 13 percent of all accidents involved drivers with license restrictions. Their involvement was even

Table 31. Data Concerning License Restrictions or Physical Disabilities.

1.	Percentage of Drivers with a License Restriction	16
2.	Percentage of Drivers Involved in all Accidents Who Had a License Restriction	13
3.	Percentage of Drivers Involved in Fatal Accidents Who Had a License Restriction	9
4.	Total Number of Accidents in which a Physical Disability was Listed as a Contributing Factor*	997
5.	Percentage of all Accidents Related to Physical Disability	0.2
6.	Number of Fatal Accidents in which a Physical Disability was Listed as a Contributing Factor*	10
7.	Percentage of Fatal Accidents Related to Physical Disability	0.4

* 1977, 1978, and 1979 accidents

less for fatal accidents; there, drivers with license restrictions were involved in only nine percent of the cases. From a total of 447,097 accidents in 1977, 1978, and 1979, only 997 (0.2 percent) had a physical disability listed as a contributing factor. There were ten fatal accidents (0.4 percent) in which a physical disability was listed as a contributing factor.

Table 32. Accident Severity and Seatbelt Usage (Drivers Only).

TYPE OF INJURY	PERCENTAGE OF OCCUPANTS SUSTAINING A GIVEN INJURY	
	NOT WEARING SEATBELT	WEARING SEATBELT
FATAL	.22	.05
INCAPACITATING	2.10	1.05
NON-INCAPACITATING	4.18	3.51
POSSIBLE INJURY	4.35	4.61

Seatbelt Usage

The use of seatbelts has been shown to be the most cost-effective means of reducing injuries and fatalities in traffic accidents, according to a summary of national safety needs (9). Analysis of Kentucky accident data demonstrates the effectiveness of seatbelts as a safety device. Statistics relating accident severity to seatbelt usage are given in Table 32. Accident severity was significantly less for occupants wearing seatbelts. For a driver involved in a traffic accident, the chance of being killed was reduced by a factor of about four to five by wearing a seatbelt; and the chance of being severely injured was reduced by a factor of two.

Despite the obvious benefits from wearing safety equipment, usage has remained low. An earlier detailed study of seatbelt usage revealed that Kentucky drivers and passengers had lower seatbelt usage rates (slightly under ten percent) than reported in other states (10). Several factors were found to have a significant effect on usage; usage was higher among drivers over 25 years of age, in newer cars, on interstates and parkways, in large cities, in out-of-state cars, and among drivers with a college education. Accident records show that seatbelt usage by drivers has actually decreased over the three-year study period. Seatbelt usage for drivers involved in accidents has decreased from 7.8 percent in 1977 to 6.3 percent in 1978 to 5.3 percent in 1979.

Table 11 shows, by county, the percentage of drivers involved in accidents who were using safety equipment.

Table 33. Safety Equipment Usage Summary by County Population Groups.

POPULATION CATEGORY	AVERAGE USAGE (PERCENT)	COUNTIES WITH LOWEST USAGE RATES	RATE (PERCENT DRIVERS USING SAFETY EQUIPMENT)	COUNTIES RECOMMENDED FOR TRIAL PUBLICITY CAMPAIGNS
Under 10,000	2.9	Crittenden	0.9	Crittenden
		Lee	0.9	
		Clinton	1.0	
		Carlisle	1.2	
		Nicholas	1.2	
10,000-19,999	2.6	Adair	0.8	Lewis
		Lewis	1.0	
		Casey	1.1	
		Caldwell	1.2	
		Green	1.2	
		Estill	1.3	
		Leslie	1.3	
20,000-49,999	3.7	Letcher	0.9	Perry
		Jessamine	1.1	
		Perry	1.2	
50,000-100,000	3.8	McCracken	2.5	Warren
		Pike	2.7	
		Warren	2.8	
Over 100,000	10.8	Kenton	5.6	Kenton

There was a wide range in usage -- a low of 0.80 percent in Adair County to a high of 11.9 percent in Fayette County. Usage increased slightly as population increased in the low population ranges and then increased greatly in counties with a population over 100,000. Also, counties containing interstates or parkways tended to have higher usage rates. The counties with the lowest usage rates for each population category are summarized in Table 33.

Child Restraints

Accident records for 1978 and 1979 were analyzed to determine the usage and effectiveness of child restraints (Table 34). Given the distribution of ages on the RAPID accident file, it was decided to use accident data for children under four years of age. The types of restraints used were categorized as seatbelt or harness, child restraint, any restraint (either lap belt, harness, or child

Table 34. Usage and Effectiveness of Child Restraints (1978-1979 Accident Data for Children under Four Years of Age).

		RESTRAINT USED			
VARIABLE	CATEGORY	NONE	SEATBELT OR HARNESS	CHILD RESTRAINT	ANY RESTRAINT
Number with Given Injury	Fatal	24	1	1	2
	Incapacitating	201	3	6	9
	Non-Incapacitating	699	15	28	43
	Possible Injury	859	30	41	71
	None	12,145	392	588	980
Percent with Given Injury	Fatal	.17	.23	.15	.18
	Incapacitating	1.44	0.68	0.90	0.81
	Non-Incapacitating	5.02	3.40	4.22	3.89
	Possible Injury	6.17	6.80	6.18	6.42
	None	87.20	88.55	88.60	88.70
Ejection	Yes	106	8	5	13
	No	13,821	433	655	1,088
	Percent Ejected	0.76	1.81	0.76	1.18
Percent Useage by Seat Position	Middle Front	93.5	2.1	4.4	6.5
	Right Front	92.9	3.4	3.7	7.1
	Left Front	91.2	4.1	4.7	8.8
	Middle Rear	93.2	2.7	4.0	6.7
	Right Rear	89.1	4.1	6.8	10.9
	Total	92.6	2.9	4.4	7.4
Percent with Given Injury by Seat Position (Middle Front)	Fatal	.15	.76	.39	.51
	Incapacitating	1.39	0.76	1.93	1.54
	Non-Incapacitating	5.66	0.76	6.18	4.35
	Possible Injury	5.55	10.60	6.95	8.18
(Right Front)	Fatal	.25	0	0	0
	Incapacitating	1.81	.62	0	.30
	Non-Incapacitating	5.93	5.00	2.84	3.87
	Possible Injury	6.68	5.62	8.52	7.14
(Left Rear)	Fatal	.16	0	0	0
	Incapacitating	1.10	0	1.52	.83
	Non-Incapacitating	3.46	3.64	3.03	3.31
	Possible Injury	4.49	1.82	4.54	3.31
(Middle Rear)	Fatal	.14	0	0	0
	Incapacitating	1.56	0	0	0
	Non-Incapacitating	3.41	2.38	3.28	2.91
	Possible Injury	5.68	9.52	0	3.88
(Right Rear)	Fatal	.08	0	0	0
	Incapacitating	1.09	1.54	0	.62
	Non-Incapacitating	2.72	3.08	3.09	3.09
	Possible Injury	3.73	3.08	5.16	4.32

restraint), or no restraint used. For this age distribution, restraint usage should be largely limited to child restraints. However, a significant number of children were coded as wearing a lap belt or harness. Some of the children coded as being restrained by a lap belt or harness were probably in a child restraint, but they could not be identified without a substantial effort. Therefore, one category used in the summaries was the use of any restraint (either a lap belt, harness, or child restraint).

An analysis of injury as a function of restraint usage showed an overall reduction in injury severity with the use of a restraint. However, severe injuries still occurred even when a restraint was used. Of 26 fatalities, only two involved a restraint, but given the low usage rate, the percentage of fatals was almost identical for children restrained versus those who were not. The use of a restraint system did not reduce the percentage ejected. The injuries were also classified by seat position. Generally, the restraints appeared to be more effective when used in the rear seat.

The analysis of accident data did not show the expected benefits from using a restraint system for children. Possible reasons could be either the use of inadequate equipment or improper use of equipment. More detailed research should be done to determine the effectiveness of specific child restraints in reducing accident severity and whether the effective restraints are being used properly.

55-mph Speed Limit

The relationship between speeds and accident rates on interstates and two-lane highways was investigated in an earlier study (11). Accident rates were found to increase as speeds increased. This relationship was more pronounced for wet-surface accidents, particularly on interstates. It was concluded that the continuation of a maximum speed limit of 55 mph (24.6 m/s) on all rural highways was advisable.

The percentage of vehicles exceeding the 55-mph (24.6 m/s) speed limit has been monitored and reported by the Kentucky Department of Transportation on a quarterly basis since 1978. A summary of the 1980 data is given in Table 35. The summary shows that 30,267 vehicles were monitored at 78 locations. The percentage of vehicles exceeding 55 mph (24.6 m/s) on all roads was 30.8 percent. The average speed was highest on sections of rural interstate and lowest on rural two-lane roads. Only 29 percent of the vehicles were exceeding the 55-mph (24.6 m/s) limit on rural two-lane roads compared to 74 percent on sections of rural interstate.

Another summary was prepared to show overall compliance with the 55-mph speed limit during 1979 and 1980 (Table 36). Generally, the percentages of vehicles exceeding 55 miles per hour (24.6 m/s) were slightly less in 1980 as compared to 1979. The most notable difference was for multilane divided highways, on which the percentage of motorists exceeding the 55-mph (24.6 m/s) speed limit decreased from 66.7 in 1979 to 57.0 in 1980.

Table 35. Summary of Speed Monitoring Program for 1980.

	MILES	NUMBER OF MONITOR LOCATIONS	NUMBER OF VEHICLES MEASURED	DURATION OF MEASUREMENT SPEED (HOURS)	AVERAGE SPEED (MPH)	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)	PERCENT OF MOTORISTS EXCEEDING 55 MPH	60 MPH	65 MPH
Interstate, Urban	81	7	3,243	14.0	54.8	54.9	59.9	45.2	11.7	2.0
Interstate, Rural	552	13	5,265	26.0	58.8	58.7	64.1	73.9	35.1	9.8
Multi-Lane, Divided	892	24	9,382	48.0	56.5	56.5	62.2	57.0	24.1	6.3
Multi-Lane, Undivided	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Two-Lane, Rural	22,551	34	12,377	68.0	52.0	52.4	58.0	28.7	9.3	2.1
STATE TOTAL	24,076	78	30,267	156.0	52.3	52.7	58.3	30.8	10.5	2.4

Table 36. Compliance with 55-mph Speed Limit (Comparison of 1979 and 1980 Data).

Highway Type	MEDIAN SPEED		85TH PERCENTILE SPEED		PERCENT OF MOTORISTS EXCEEDING 55 MPH	
	1979	1980	1979	1980	1979	1980
Interstate, Urban	54.8	54.9	60.1	59.9	45.0	45.2
Interstate, Rural	59.2	58.7	64.5	64.1	76.1	73.9
Multi-Lane, Divided	58.1	56.5	63.7	62.2	66.7	57.0
Two-Lane, Rural	52.3	52.4	58.2	58.0	29.4	28.7
STATE TOTAL	52.7	52.7	58.6	58.3	31.9	30.8

Pedestrians

Counties and cities that had high rates for motor-vehicle accidents involving pedestrians are listed, by population group, in Table 37. The rates in this table were taken from Tables 6 and 10. The counties with the highest rates were Campbell and Kenton; Carlisle, Caldwell, and Henderson Counties had the highest rates in their population categories. Newport and Covington had the highest rates for cities; Evarts, London, Bellevue, Florence, and Louisville had the highest rates in their population groups. This indicates the existence of a definite pedestrian accident concentration in northern Kentucky. Listed in Table 37 are Boone, Campbell, and Kenton counties and the cities of Ludlow, Bellevue, Dayton, Florence, Newport, and Covington, all of which are located in northern Kentucky. Another problem area appears to be a line of four counties -- Carroll, Henry, Franklin, and Anderson -- that extends down from the Ohio river. Cities with high pedestrian accident rates show, in addition to the Northern Kentucky concentration, a large number in southeastern Kentucky, with nine of the 19 cities listed being located in this area of the state.

Additional information on pedestrian accidents can be found in Table 38. This table presents a breakdown by sex and age of all pedestrians involved in accidents in 1978 and 1979. Over 60 percent of the pedestrians were male, and over 25 percent were under the age of 10. Nearly 50 percent were from 10 to 34 years old, and just over 25 percent were 35 or older.

Tables 12 and 13 also contain information on pedestrian accidents. The most common human contributing factors for pedestrian accidents were driver inattention and failure to yield right of way. Defective brakes was the most common vehicular contributing factor; slippery surface and obstructed view were the most common roadway contributing factors. Overall, driver inattention and slippery surface were the most often listed contributing factors. From Table 13, it can be seen that pedestrian accidents tended to be very severe, with nearly 90 percent resulting in injury and six percent resulting in fatalities.

The accident trend analysis shown in Table 14 shows the number of accidents involving pedestrians has remained constant over the three-year study period.

Table 37. Counties and Cities with High Accident Rates for Pedestrians.

POPULATION CATEGORY	COUNTIES AND CITIES WITH HIGH RATES	NUMBER OF PEDESTRIAN ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (ACCIDENTS PER 10,000 POP)
COUNTIES			
Under 10,000	Carlisle	7	4.3
	Carroll	12	4.3
10,000-19,999	Caldwell	23	5.7
	Henry	21	5.5
	Anderson	19	5.0
20,000-49,999	Henderson	109	8.9
	Boone	78	5.7
	Franklin	66	5.3
	Bell	49	5.1
50,000-100,000	Campbell	270	10.9
Over 100,000	Kenton	425	10.4
CITIES			
1,000-2,499	Evarts	6	16.3
	Clay City	6	15.7
	Whitesburg	7	15.3
	Cadiz	7	14.1
	Salyersville	5	12.5
2,500-4,999	London	16	13.4
	Harlan	12	13.2
	Ludlow	17	11.5
	Pikeville	15	10.5
5,000-9,999	Bellevue	26	11.2
	Cynthiana	19	10.8
	Dayton	22	10.6
	Mount Sterling	18	10.3
10,000-19,999	Florence	43	9.2
	Somerset	27	8.6
20,000-29,999	Newport	182	28.5
	Henderson	90	12.1
30,000-99,999	Covington	283	19.3
Over 200,000	Louisville	1,565	10.7

Table 38. Pedestrian Accident Information.*

VARIABLE	CATEGORY	PERCENT OF TOTAL
Sex	Male	61.2
	Female	38.8
Age	0-4	5.4
	5-9	20.5
	10-15	16.8
	16-24	19.5
	25-34	11.3
	35-44	6.2
	45-54	5.2
	55-64	6.7
	65-74	4.5
	75 & Older	3.9

* 1978 and 1979 accidents only

Bicycles

Information concerning motor-vehicle accidents involving bicycles is given in Tables 39 and 40. Table 39 lists, by population category, those counties and cities with high bicycle-accident rates. The rates listed in this table were taken from Tables 6 and 10. Daviess and Campbell Counties had the highest rates in the state; Cold Springs and Bellevue, both in Campbell County, and Owensboro, in Daviess County, had the highest rates for cities. In addition, Carroll, Ballard, Henderson, and Kenton Counties as well as the cities of Carrollton, Erlanger, Newport, and Louisville had the highest rates in their respective population categories. It should be noted that all but one (Marion County) of the counties with high rates are adjacent to the Ohio River, which is the northern border of Kentucky. In addition, all of the cities with high rates are either directly adjacent to the river or very close to it.

Table 40 presents a breakdown by sex and age for bicyclists involved in accidents in 1977 through 1979. Over three-fourths of the bicyclists were males and nearly three-fourths were under the age of 16.

Additional information on bicycle accidents can be found in Tables 12 and 13. Among human contributing factors, the most common were driver inattention and failure to yield right of way. Considering vehicular contributing factors, the most common was defective brakes. For roadway contributing factors, obstructed view and slippery surface were listed most often. Overall, driver

Table 39. Counties and Cities with High Accident Rates for Bicycles.

POPULATION CATEGORY	COUNTIES AND CITIES WITH HIGH RATES	NUMBER OF BICYCLE ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (ACCIDENTS PER 10,000 POPULATION)
COUNTIES			
Under 10,000	Carroll	9	3.2
	Gallatin	4	2.8
10,000-19,999	Ballard	8	2.6
	Marion	12	2.3
	Union	11	2.1
20,000-49,999	Henderson	48	3.9
50,000-100,000	Daviess	134	5.2
	Campbell	110	4.4
Over 100,000	Kenton	159	3.9
CITIES			
1,000-2,499	Cold Springs	6	9.4
	Uniontown	2	5.6
2,500-4,999	Carrolton	7	5.9
	Morganfield	6	5.3
5,000-9,999	Bellevue	18	7.7
	Edgewood	11	5.1
	Fort Mitchell	11	5.1
10,000-19,999	Erlanger	19	4.4
20,000-29,999	Newport	47	7.4
	Henderson	41	5.5
30,000-99,999	Owensboro	125	7.7
Over 100,000	Louisville	689	4.7

inattention and failure to yield right-of-way were the most often listed. Table 13 shows that bicycle accidents tended to be very severe, with nearly 80 percent resulting in injuries and two percent resulting in fatalities.

The accident trend analysis shown in Table 14 shows the number of accidents involving bicycles has remained fairly constant over the three-year study period. However, there was a slight increase in the number of bicycle-related accidents from 1978 to 1979.

Motorcycles

Information on motorcycle accidents is contained in Table 41, which lists, by

Table 40. Bicycle Accident Information.*

VARIABLE	CATEGORY	PERCENT OF TOTAL
Sex	Male	77.2
	Female	22.8
Age	0-4	0.6
	5-9	21.6
	10-11	14.4
	12-13	18.1
	14-15	17.8
	16-19	13.1
	20 & OLDER	14.4

* 1977 - 1979 accident data

Table 41. Counties and Cities with High Accident Rates for Motorcycles.

POPULATION CATEGORY	COUNTIES AND CITIES WITH HIGH RATES	NUMBER OF MOTORCYCLE ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (ACCIDENTS PER 10,000 POPULATION)
COUNTIES			
Under 10,000	Carroll	16	5.7
	Trigg	16	5.7
10,000-19,999	Caldwell	23	5.7
	Mason	28	5.3
	Mercer	30	5.3
20,000-49,999	Boone	104	7.6
	Henderson	87	7.1
	Meade	47	6.9
50,000-100,000	McCracken	159	8.7
	Warren	172	8.2
Over 100,000	Fayette	424	7.0
	Jefferson	1,429	7.0
CITIES			
1,000-2,499	Salyersville	5	12.5
	Greenup	5	12.1
	Muldraugh	6	11.4
	Brandenburg	6	10.8
2,500-4,999	Marion	18	17.6
	London	14	11.7
5,000-9,999	Hazard	14	8.6
	Williamsburg	14	8.5
10,000-19,999	Radcliff	55	12.7
	Elizabethtown	48	10.4
20,000-29,999	Newport	56	8.8
30,000-99,999	Bowling Green	125	10.7
	Paducah	95	10.4
Over 100,000	Louisville	1,153	7.9

population group, the counties and cities with high accident rates for motorcycles. The rates in this table come from Tables 6 and 10. The counties with the highest rates were McCracken and Warren; Marion and Salyersville had the highest rates for cities. Other counties and cities with the highest rates in their population categories were Carroll, Caldwell, Boone, and Fayette Counties and the cities of Hazard, Radcliff, Newport, Bowling Green, and Louisville. The counties with high rates were fairly evenly distributed throughout the northern and western areas of the state. No counties with high rates were located in eastern Kentucky, but five cities with high rates were in the eastern part of the state. One problem area that is evident is the Meade County, Hardin County, Jefferson County area along the Ohio River, with four high-rate cities located in these three contiguous counties.

Tables 12 and 13 contain additional information on motorcycle accidents. The most common contributing factors for motorcycle accidents were failure to yield right of way, driver inattention, and unsafe speed, all of which are human factors. Among vehicular factors, brakes were the leading problem; view obstruction and slippery surface were the leading roadway factors. The severity information

Table 42. Statewide Accident Rates by Vehicle Type.

VEHICLE TYPE	ACCIDENT RATE (ACCIDENTS PER 100 MILLION VEHICLE MILES) RURAL	URBAN	TOTAL
Passenger Car	264	634	393
Single Unit Truck	301	1253	489
Combination Truck	206	748	284
Bus	557	1608	892
Motorcycle	917	1984	1248

in Table 13 shows that motorcycle accidents tended to be very severe, with nearly three-fourths resulting in injuries and three percent causing fatalities.

Table 42 contains accident rates, in terms of accidents per 100 MVM (160 MVK), for five different vehicle types; passenger cars, single-unit trucks, combination trucks, buses, and motorcycles. This table shows that motorcycles had the highest accident rate of any of these five vehicle types.

The accident trend analysis shown in Table 14 shows that the number of accidents involving motorcycles has remained very constant over the three-year study period.

School Buses

The numbers of accidents involving school buses and the resulting accident rates (accidents per population) were summarized by county in Table 10. Those counties with the highest school-bus-related accident rates are summarized by population category (Table 43). Lee and Carlisle Counties had the highest rates; Jefferson and Fayette Counties had the highest numbers of accidents.

Table 43. Counties with High Accident Rates for School Buses.

POPULATION CATEGORY	COUNTIES WITH HIGH RATES	NUMBER OF SCHOOL BUS ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (ACCIDENTS PER 10,000 POPULATION)
Under 10,000	Lee	9	3.9
	Carlisle	6	3.7
	Gallatin	5	3.5
10,000-19,999	Butler	10	3.0
	Marion	16	3.0
	Mason	16	3.0
20,000-49,999	Clark	26	3.1
	Jessamine	23	2.9
50,000-100,000	Boyd	44	2.6
	Daviess	66	2.6
Over 100,000	Fayette	170	2.8
	Jefferson	531	2.6

The accident trend analysis shown in Table 14 shows that the number of accidents involving school buses increased from 1977 to 1978 and again in 1979. School-bus accidents increased 17.9 percent in 1979 compared to the three-year average from 1977 to 1979.

An analysis of contributing factors by vehicle type showed that defective brakes were involved in a higher percentage of accidents involving school buses, as compared to other vehicle types (Table 12). Also, a high percentage of these accidents involved view obstructions. An analysis of accident severity showed accidents involving school buses to have a very low severity compared to most other vehicle types (Table 13).

Commercial Buses

A summary of accidents and accident rates (in terms of population) by vehicle type for each county is given in Table 10. Counties with high accident rates for commercial buses were extracted and presented in Table 44. Generally, those counties with high accident rates for commercial buses are urbanized areas with interstate or primary routes connecting population centers. Portions of six of the ten counties in Table 44 were served by local bus companies.

Statewide accident rates, in terms of vehicle-miles of travel, are presented in Table 42. This table, which compares five vehicle types for rural, urban, and total travel, shows buses to have the highest rate of accidents of all types except motorcycles. It should be noted that this category of buses includes both commercial buses and school buses.

From the summary of contributing factors (Table 12), the categories of improper turning, brake failures, and improperly parked vehicles were over-represented in commercial-bus accidents. Improperly parked vehicles would most likely be in reference to other vehicles parked too close to corners such that the turning movement of a bus was inhibited.

The accident severity information in Table 13 shows that accidents involving commercial buses had low severity.

The accident trend analysis given in Table 14 shows there has been a substantial reduction in the number of accidents involving commercial buses over the three-year study period. The number of accidents in 1979 was 18 percent below the three-year average. The number of accidents decreased from 1977 to 1978 and again in 1979.

Table 44. Counties with High Accident Rates for Commercial Buses.

POPULATION CATEGORY	COUNTIES WITH HIGH ACCIDENT RATES	NUMBER OF ACCIDENTS* (1977-1979)	ANNUAL ACCIDENT RATE (PER 10,000 POPULATION)
Under 10,000	Clinton	5	1.8
	Lyon	3	1.5
	Gallatin	2	1.4
	Livingston	4	1.4
	Trigg	4	1.4
	Carlisle	2	1.2
10,000-19,999	Mason	17	3.2
	Anderson	8	2.1
20,000-49,999	Boone	35	2.6
	Henderson	28	2.3
	Clark	17	2.0
50,000-100,000	Campbell	90	3.6
Over 100,000	Jefferson	1,263	6.2
	Kenton	237	5.8

* Commercial bus accidents

Table 45. Counties with High Accident Rates for Combination Trucks.

POPULATION CATEGORY	COUNTIES WITH HIGH ACCIDENT RATES	NUMBER OF ACCIDENTS* (1977-1978)	ANNUAL ACCIDENT RATE (PER 10,000 POPULATION)
Under 10,000	Gallatin	74	51.2
	Carroll	131	47.0
10,000-19,999	Grant	168	42.2
	Lawrence	175	41.3
20,000-49,999	Boone	671	49.1
50,000-100,000	Boyd	339	20.4
Over 100,000	Kenton	896	21.9
	Fayette	1,117	18.3

*Number of combination truck accidents

Combination Trucks

Counties with high accident rates for combination trucks are presented in Table 45. These rates are given for each county in Table 10. As expected, most counties with high rates for combination trucks were traversed by one of the interstate highways. The only exception was Lawrence County, which was probably included because of the heavy volume of coal-truck traffic on US 23. Boone and Gallatin Counties had the highest rates.

Statewide accident rates, in terms of vehicle-miles of travel, by vehicle type are presented in Table 42. This table shows combination trucks to have the

lowest overall accident rate. The very low rate in rural areas was expected because of their heavy use of interstate routes and parkways, which have the lowest accident rates.

From the summary of contributing factors for various vehicle types (Table 12), it was noted that the categories of unsafe speed, improper turn, defective brakes, tire failure, oversized load, and defective shoulders were overrepresented in combination-truck accidents as compared to all accidents. Another area where combination trucks varied from the norm was the percentage of fatal accidents. Results in Table 13 show the percentage of fatal accidents for accidents involving combination trucks was over twice the percentage for all accidents.

The accident trend analysis shown in Table 14 shows that the number of accidents involving combination trucks in 1979 was slightly above (5.8 percent) the three-year study average. This resulted from a smaller number of such accidents in 1977. The number of this type of accident actually decreased slightly from 1978 to 1979.

Single-Unit Trucks

Data taken from Table 10 and summarized in Table 46 show those counties with the highest accident rates for single-unit trucks. All counties with high rates, with the exception of Boyle County, were either those traversed by interstate routes or those with high volumes of coal-truck traffic. Johnson and Jefferson Counties appear to have the most severe accident problem with single-unit trucks.

Statewide accident rates in Table 42 show that single-unit trucks had an accident rate of 489 per 100 million vehicle-miles (160 million vehicle-kilometers) as compared to a rate of 393 for passenger cars. This rate was influenced significantly by the high rate of accidents for single-unit trucks in urban areas (1,253 accidents per 100 MVM (160 MVK)).

From the summary of contributing factors for various vehicle types in Table 12, it was noted that several categories of contributing factors were over-represented in accidents involving single-unit trucks when compared to all accidents. These categories were brake failure, improper load, oversized load, and improper passing.

The severity of this type of accident was comparable to that for all accidents (Table 13). The accident trend analysis showed a substantial decrease (9.7 percent) in this type of accident in 1979 compared to the three-year average (Table 14).

Table 46. Counties with High Accident Rates for Single-Unit Trucks.

POPULATION CATEGORY	COUNTIES WITH HIGH ACCIDENT RATES	NUMBER OF S-U TRUCK ACCIDENTS (1977-1979)	ANNUAL ACCIDENT RATE (PER 10,000 POPULATION)
Under 10,000	Gallatin	50	34.6
	Carroll	80	28.7
	Wolfe	57	28.3
	Cumberland	60	27.7
10,000-19,999	Breathitt	236	46.4
	Mason	238	45.2
	Grant	178	44.7
20,000-49,999	Johnson	373	51.1
	Boyle	772	46.4
	Floyd	646	44.4
	Perry	444	44.4
50,000-100,000	Boyd	772	46.4
	Pike	1,012	41.8
Over 100,000	Jefferson	13,274	64.9

Railroads

Counties with the highest accident rates involving motor vehicles and railroad trains are summarized in Table 47. The accident rates, calculated as accidents per 10,000 population, were taken from Table 10. Counties with the highest rates were Carroll and Webster; however, Jefferson County had the largest number of accidents.

Data in Table 12 show that failure to yield right of way was a contributing

Table 47. Counties with High Accident Rates for Motor-Vehicle Accidents Involving Railroad Trains.

POPULATION CATEGORY	COUNTIES WITH HIGH ACCIDENT RATES	NUMBER OF TRAIN ACCIDENTS (1977-1978)	ANNUAL ACCIDENT RATE (PER 10,000 POPULATION)
Under 10,000	Carroll	11	4.0
10,000-19,999	Webster	14	3.1
	McCreary	12	2.6
	Lincoln	13	2.3
20,000-49,999	Oldham	15	1.8
50,000-100,000	Daviess	43	1.7
Over 100,000	Fayette	42	0.7
	Jefferson	147	0.7

factor in over 26 percent of train-related accidents. The percentage of train-related accidents involving disregard of traffic controls or an obstructed view as contributing factors was much higher than the corresponding percentage for all accidents. Another expected accident statistic was the overrepresentation of fatal and injury accidents for train-related motor-vehicle accidents (Table 13). The accident trend analysis showed a slight reduction (6.4 percent) of train-related accidents in 1979 compared to the three-year average (Table 14).

Emergency Vehicles

Counties with high accident rates (per 10,000 population) for emergency vehicles are identified in Table 48. Data were taken from the general summary of accidents and accident rates for several vehicle types in Table 10. The highest number of accidents involving emergency vehicles occurred in Jefferson, Fayette, and Kenton Counties. Counties with the highest accident rates (per 10,000 population) were Gallatin and Grant.

From the summary of contributing factors in Table 12, it was found that contributing factors for accidents involving emergency vehicles were overrepresented in the categories of unsafe speed, failure to yield right of way, and slippery surface. The severity of this type of accident was slightly below that for all accidents (Table 13). There has been an increase in this type of accident over the three-year study period (Table 14).

Table 48. Counties with High Accident Rates for Emergency Vehicles.

POPULATION CATEGORY	COUNTIES WITH HIGH ACCIDENT RATES	NUMBER OF ACCIDENTS* (1977-1978)	ANNUAL ACCIDENT RATE (PER 10,000 POPULATION)
Under 10,000	Gallatin	6	4.2
10,000-19,999	Grant	13	3.3
20,000-49,999	Franklin	40	3.2
50,000-100,000	Madison	41	2.6
	Warren	46	2.2
Over 100,000	Kenton	79	1.9
	Fayette	100	1.6

* Emergency vehicle accidents.

Vehicle Defects

Effective in 1978, the annual vehicle inspection law was repealed in Kentucky. The involvement of vehicle defects in accidents before and after repeal of this law is summarized in Table 49. A 20-month "before" period and a 19-month "after" period were used in the comparison. It was found that the percentage of all accidents involving vehicle defects increased from 5.86 percent in the "before" period to 7.09 percent in the "after" period. The last report showed this percentage was 6.58 percent in the first seven months after repeal of the law (2). During the calendar year of 1979, this percentage was 7.4 percent. It is logical that the effects resulting from the lack of vehicle inspections would become more noticeable with time.

Emergency Services Arrival Times

Data related to emergency services arrival times at the scenes of motor-

Table 49. Accidents Involving Vehicle Defects Before and After Repeal of Vehicle Inspection Law.

TIME PERIOD	TOTAL NUMBER OF ACCIDENTS	NUMBER OF ACCIDENTS INVOLVING VEHICLE DEFECTS	PERCENT OF ALL ACCIDENTS INVOLVING VEHICLE DEFECTS
October 1976 - May 1978 (20 Months Before Repeal of Law)	246,500	14,440	5.86
June 1978 - December 1979 (19 Months After Repeal of Law)	233,155	16,527	7.09

vehicle accidents are given in Table 11 for each county. These numbers are for the time from notification to arrival of emergency services. This time was over 10 minutes at least 50 percent of the time in 27 counties. Table 50 lists, by population group, the counties with shortest and longest response times. Campbell County had the shortest response times in the state; Fulton, Woodford, Franklin, and Kenton Counties had the shortest times in their respective population groups. Menifee County had the longest response times in the state; Leslie, Letcher, Pike, and Fayette Counties had the longest times in their respective population categories.

Table 50. Counties with Shortest and Longest Emergency Services Response Times.*

COUNTIES WITH SHORTEST RESPONSE TIMES			COUNTIES WITH LONGEST RESPONSE TIMES		
POPULATION CATEGORY	COUNTY	PERCENT OVER 10 MINUTES	POPULATION CATEGORY	COUNTY	PERCENT OVER 10 MINUTES
Under 10,000	Fulton	15.8	Under 10,000	Menifee	77.5
	Crittenden	22.2		Wolfe	72.3
	Carroll	25.9		Elliott	71.2
				Livingston	69.5
10,000-19,999	Woodford	12.9		Carlisle	66.3
	Wayne	19.5			
	Caldwell	19.9	10,000-19,999	Leslie	77.1
	Mercer	20.8		Knott	72.0
	Mason	21.4		McLean	66.0
				Breathitt	64.2
20,000-49,999	Franklin	16.2			
	Taylor	16.3	20,000-49,999	Letcher	63.6
	Clark	17.5		Floyd	52.0
	Calloway	18.0		Clay	47.0
	Henderson	18.1		Harlan	46.9
50,000-100,000	Campbell	6.5	50,000-100,000	Pike	54.7
	Daviess	9.6		Hardin	23.0
Over 100,000	Kenton	8.4	Over 100,000	Fayette	26.2
				Jefferson	21.7

* Time used is time from notification to arrival at scene.

Summary

County Accident Statistics

1. Average and critical accident rates were calculated by population category using three accident classifications (total, injury-or-fatal, fatal). Only two counties (Perry and Warren) had accident rates above critical for all three accident classifications.

2. Several counties were identified as having rates above critical for both total and injury-or-fatal accidents, and a few had particularly high rates for their population categories in both cases. These counties included Carroll, Marion, Franklin, Clark, Campbell, and Kenton.

3. Campbell County had the highest total and injury-or-fatal accident rates. Owsley and Leslie Counties had the highest fatal accident rates. In general, total and injury-or-fatal accident rates increased as county population increased and fatal accident rates decreased as county population increased.

4. In general, the same counties were identified as having an accident problem in both this report, which used 1978 and 1979 data, and the previous report, which used 1978 data only. However, there were six new counties identified as critical and 14 counties listed previously were not identified in this report.

5. The distribution of counties with either total or injury-or-fatal rates

above critical is given in Figure 1. These counties are dispersed across the state with the largest concentration in central northern Kentucky.

City Accident Statistics

1. For cities with populations of 1,000 or more, the following cities had the highest accident rates in their population categories: Louisville, Bowling Green, Newport, Florence, Maysville, Pikeville, and Crescent Springs. Hazard, London, and Cadiz also had particularly high rates for their population categories.

2. For cities with populations under 1,000, Hindman, Wilder, Allen, and Fairview had the highest rates in their population categories. Westwood, Crestwood, and Campton also had high rates.

3. No city was identified as having a fatal-accident rate above critical.

4. The distribution of cities with a population of 1,000 or more and with accident rates above critical is given in Figure 2. The cities are dispersed across the state; but, as with counties, the largest concentration was in northern Kentucky. Kenton County contained the largest number of cities with accident rates above critical.

Fatal Accident Statistics

1. The fatal-accident rate for males was almost twice that for females. Teenage drivers had a much higher rate than other drivers. The fatal-accident rate decreased rapidly after age 25 but increased again after age 60 (7).

2. Kentucky's rate of fatal accidents per 100 million vehicle-miles (160 mvk) was 2.84 as compared to 3.11 nationwide. These three-year averages along with the individual years of 1977-1979 are presented in Figure 3.

3. The number of traffic fatalities nationwide has increased from 47,878 in 1977 to 51,083 in 1979. In Kentucky, the number of fatalities has decreased from 940 to 896 in the same time period (Figure 4).

4. Counties with fatal-accident rates above critical were identified. The following counties had the highest fatal-accident rates in their respective population categories: Owsley, Leslie, Perry, Warren, and Jefferson.

5. The following cities had the highest fatal-accident rates in their respective population categories: Louisville, Bowling Green, Henderson, Somerset, Harrodsburg, Providence, and Brandenburg.

6. Unsafe speed and alcohol

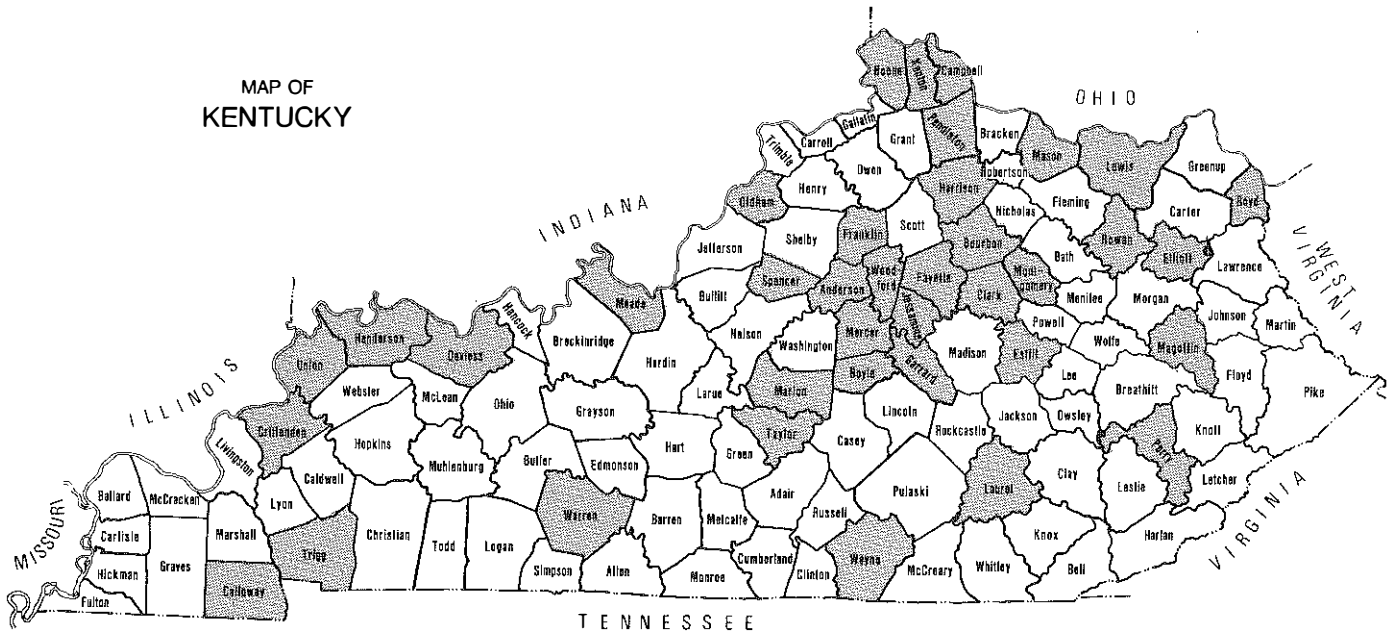

Figure 1. Counties with total or injury-or-fatal rates above critical.

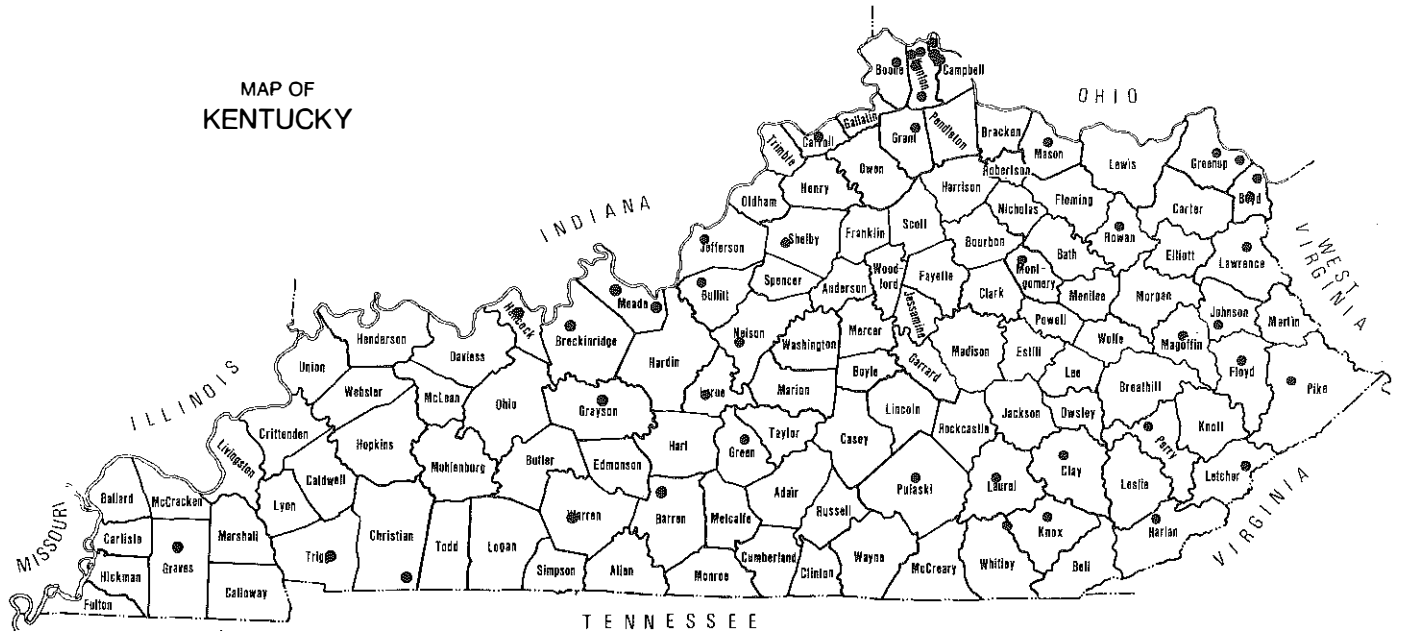

Figure 2. Cities with accident rates above critical (population of 1,000 or more).

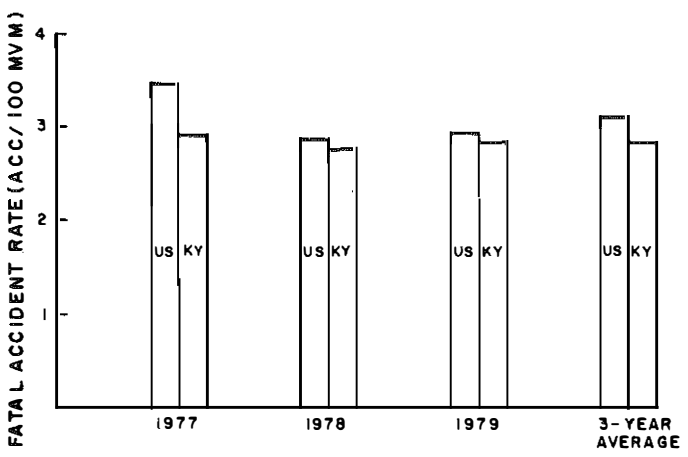

Figure 3. Comparison of Kentucky fatal accident rates with the national rates.

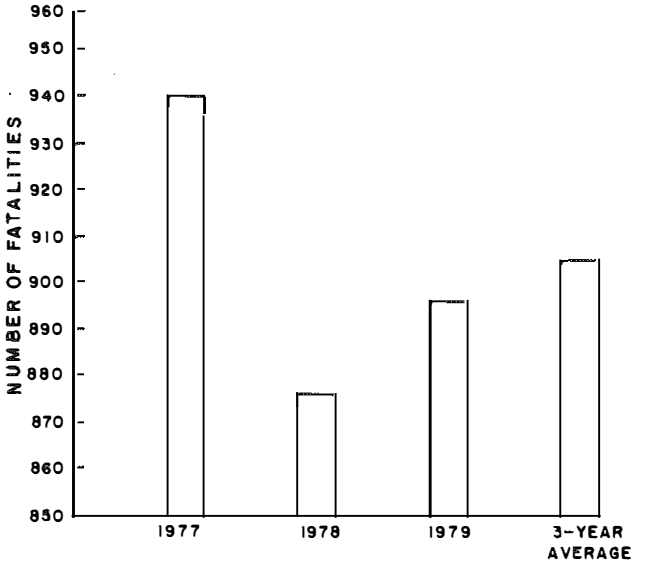

Figure 4. Trends in Kentucky traffic fatalities for 1977 through 1979.

involvement were contributing factors that were overrepresented when fatal accidents were compared to all accidents.

Accident Statistics by Driver Age and Sex

1. Accident rates, in terms of accidents per million vehicle-miles (160 mvk), were higher for female drivers than for male drivers. Considering rates by age category, teenage drivers had the highest rate. Teenage males had particularly high accident rates. The rate for drivers 65 and older was also higher than the overall rate (2). These rates are illustrated in Figure 5.

2. Over two-thirds of drivers involved in accidents in Kentucky in 1976 through 1978 were male and nearly 13 percent were 16- to 19-year-old males. Approximately 18 percent of the accident-

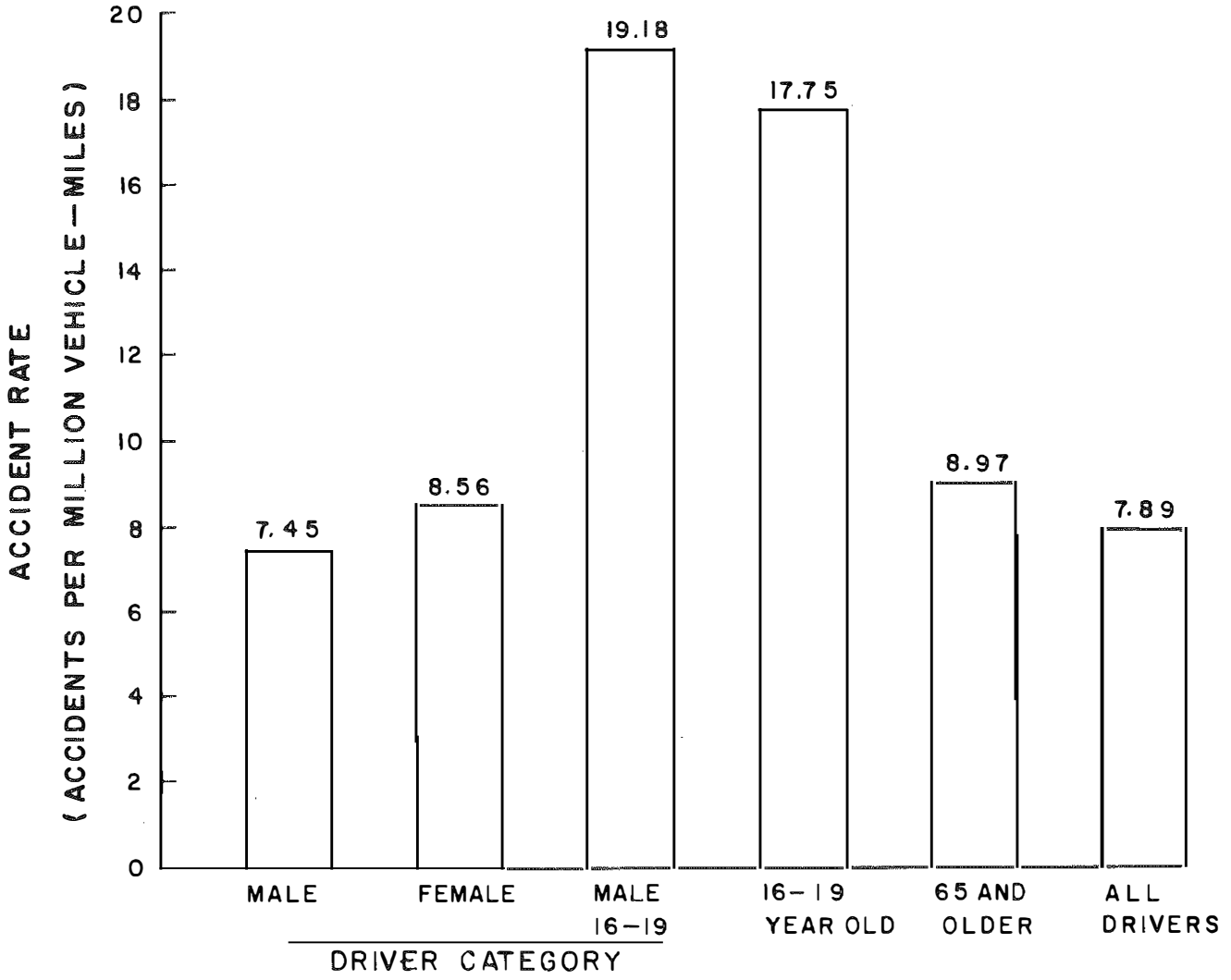

Figure 5. Accident rates by driver age and sex.

involved drivers were 16 to 19 years of age; about five percent were 65 and older.

3. Leslie and Breathitt Counties had the highest percentages of males among those drivers involved in accidents; Calloway County had the highest percentage for females. For 16- to 19-year-old males, Fulton County had the state's highest percentage. Letcher and Pendleton Counties were highest for 16- to 19-year-old drivers; Robertson and Pendleton Counties were highest for drivers 65 and older.

4. Young drivers and males tended to have more frequent single-vehicle accidents; older drivers and females were involved more frequently in rear-end and angle-type accidents (5).

5. Considering all accidents, unsafe speed and alcohol involvement were listed as contributing factors more often for young drivers and males; failure to yield was listed more often for older drivers and females (5).

6. Considering fatal accidents, unsafe speed was listed most frequently as the major contributing factor for young drivers and males. Alcohol involvement was much more predominant in males than in females. When age was considered, alcohol involvement was highest for middle-aged drivers (25 to 49 years old). Failure to yield or stop was listed more often for females and older drivers (5).

7. Teenage drivers had the highest nighttime accident rate, but the single

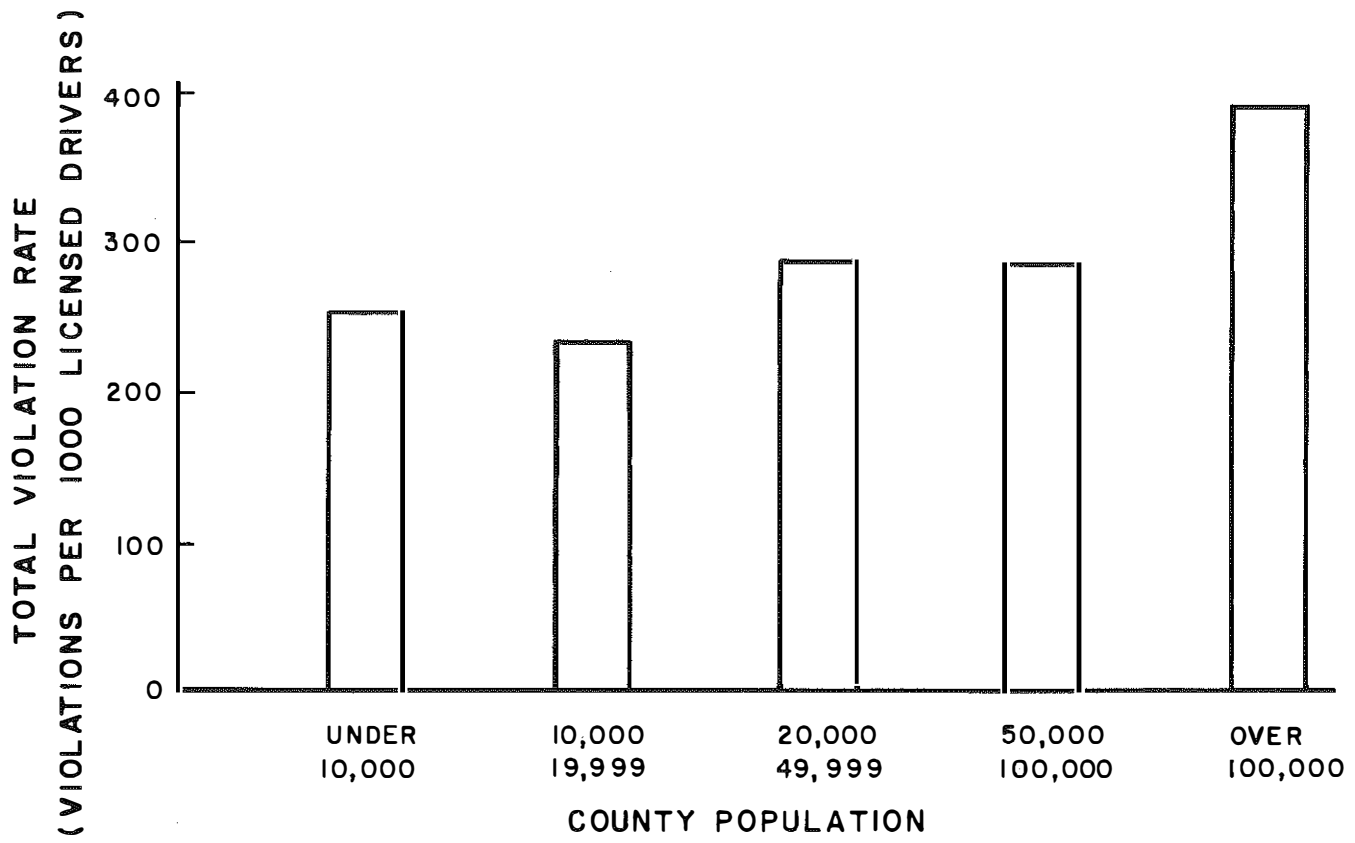

Figure 6. Relationship between county population and total violation rates.

highest nighttime accident rate was for females 70 years of age or older (5).

Driver Records

1. Counties with accident rates above critical but with total-violation rates below the average for their population categories were identified as possible candidates for increased enforcement. Fifteen such counties were identified. Also, three counties (Lewis, Marion, and Trigg) were identified as not having as high an increase in violations issued as the statewide average.

2. The total violation rate was found to increase as county population increased (as shown in Figure 6). This was also true for rates for total points, speed violations, and suspensions. However, rates for alcohol violations decreased as county population increased.

Speed-Related Accidents

1. There has been a slight decrease in the number of speed-related accidents, as shown in Figure 7.

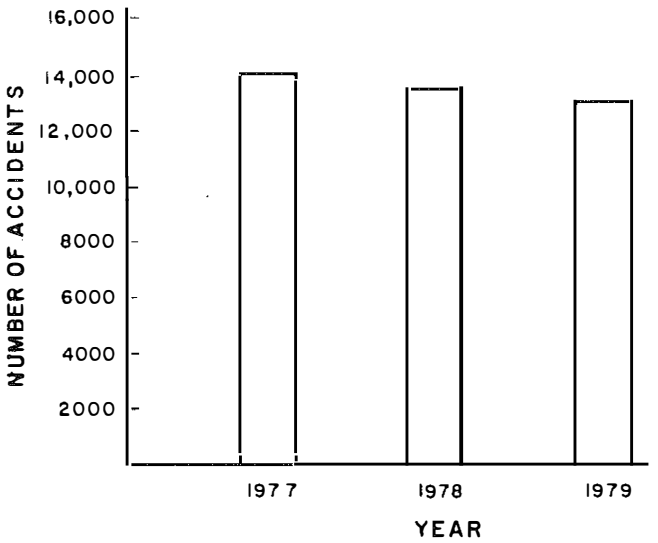

Figure 7. Trend in number of speed-related accidents.

2. Counties with high percentages of accidents involving speeding and low speed-violation rates were identified as follows: Robertson, Menifee, Spencer, Knott, Leslie, Letcher, Pike, and Jefferson.

3. Based on the same criteria as above, the following cities were identified: Jenkins, Scottsville, Independence, Fort Mitchell, Radcliff, and Louisville.

Alcohol-Related Accidents

1. Counties with high percentages of accidents involving alcohol and low alcohol-violation rates were identified as follows: Spencer, Metcalfe, Bath, Meade, Oldham, and Warren.

2. Based on the same criteria as above, the following cities were identified: Augusta, Muldraugh, Uniontown, Jenkins, and Lebanon.

3. Alcohol was the second leading contributing factor in fatal accidents.

4. The percentage of accidents involving alcohol and the alcohol-violation rate were not found to be significantly related to whether or not a county allowed the sale of alcohol.

5. There was a slight increase in the statewide number of alcohol-related accidents in 1979, as shown in Figure 8.

Drug-Related Accidents

Drugs were not found to be a major factor contributing to traffic accidents; however, the number of drug-related accidents has increased over the past three-year period, as shown in Figure 9.

License Restrictions and Handicapped Drivers

1. Drivers with license restrictions were not overrepresented in accidents when compared to all drivers.

2. Only 997 (0.2 percent) of the 447,097 accidents in 1977, 1978, and 1979 had physical disability listed as a contributing factor.

Seatbelt Usage

1. Accident records showed that, for a driver involved in a traffic accident, the chance of being killed was reduced by a factor of about four or five by wearing a seatbelt; the chance of being severely injured was reduced by a factor of two.

2. Despite the obvious benefits from wearing seatbelts, usage has remained low.

3. Accident records show a decline in usage of seatbelts for drivers involved in traffic accidents. The magnitude of

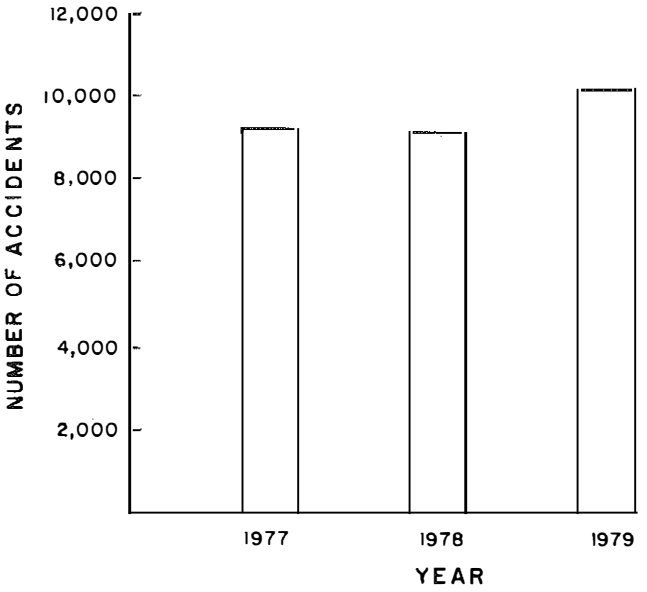

Figure 8. Trend in number of alcohol-related accidents.

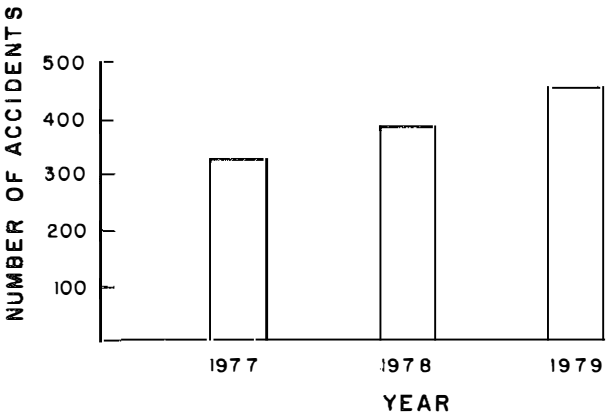

Figure 9. Trend in number of drug-related accidents over a three-year study period.

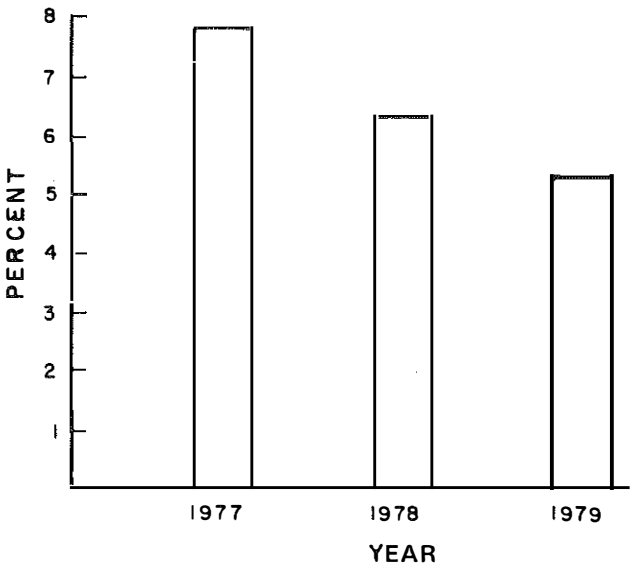

Figure 10. Percent seatbelt usage by drivers involved in accidents.

the decline over the three-year study period is shown in Figure 10.

4. Seatbelt usage varies substantially by county; the higher usages were in more populated counties. Counties having particularly low usage rates for their population categories were identified.

Child Restraints

1. Restraint usage for children under four years of age who were involved in traffic accidents was found to be very low, with only 7.4 percent restrained by any means and 4.4 percent in child restraints.

2. While restraint usage resulted in an overall reduction in injury severity, several severe injuries resulted when the child was restrained.

3. Restraint usage varied by seat position with a higher percent usage for children seated in the rear seat (Figure 11).

55-mph Speed Limit

1. The percentage of vehicles exceeding 55 miles per hour (24.6 m/s) on all roads monitored was 30.8 for the year ending September 30, 1980. Only 29 percent of the vehicles were exceeding 55 miles per hour (24.6 m/s) on rural two-lane roads as compared to 74 percent on sections of rural interstate. The percentage of vehicles exceeding 55 miles per hour (24.6 m/s) by roadway type is presented in Figure 12.

2. Generally, the percentages of vehicles exceeding 55 miles per hour (24.6 m/s) were less in 1980 as compared to 1979.

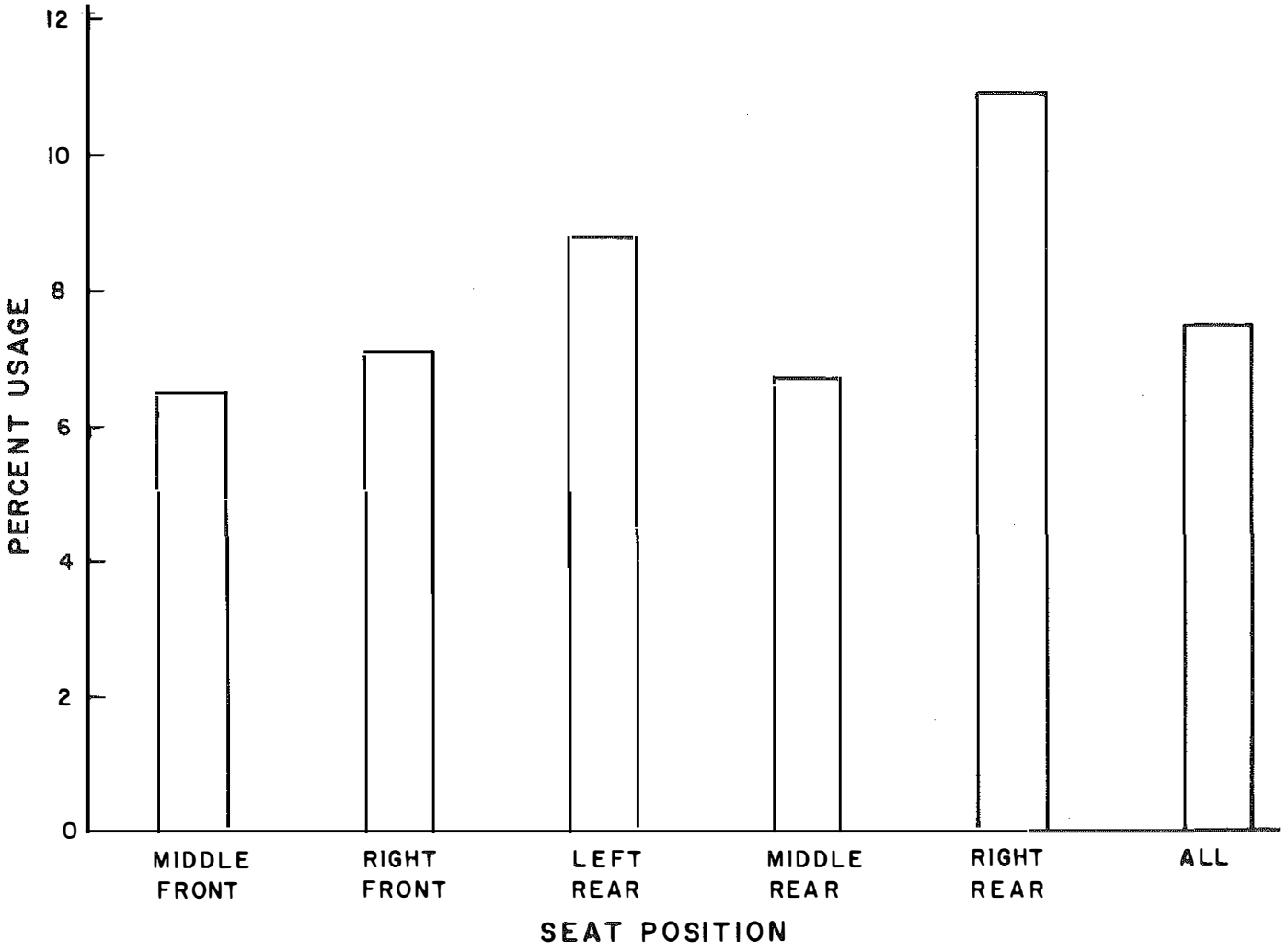

Figure 11. Restraint usage on children under four years of age as a function of seat position.

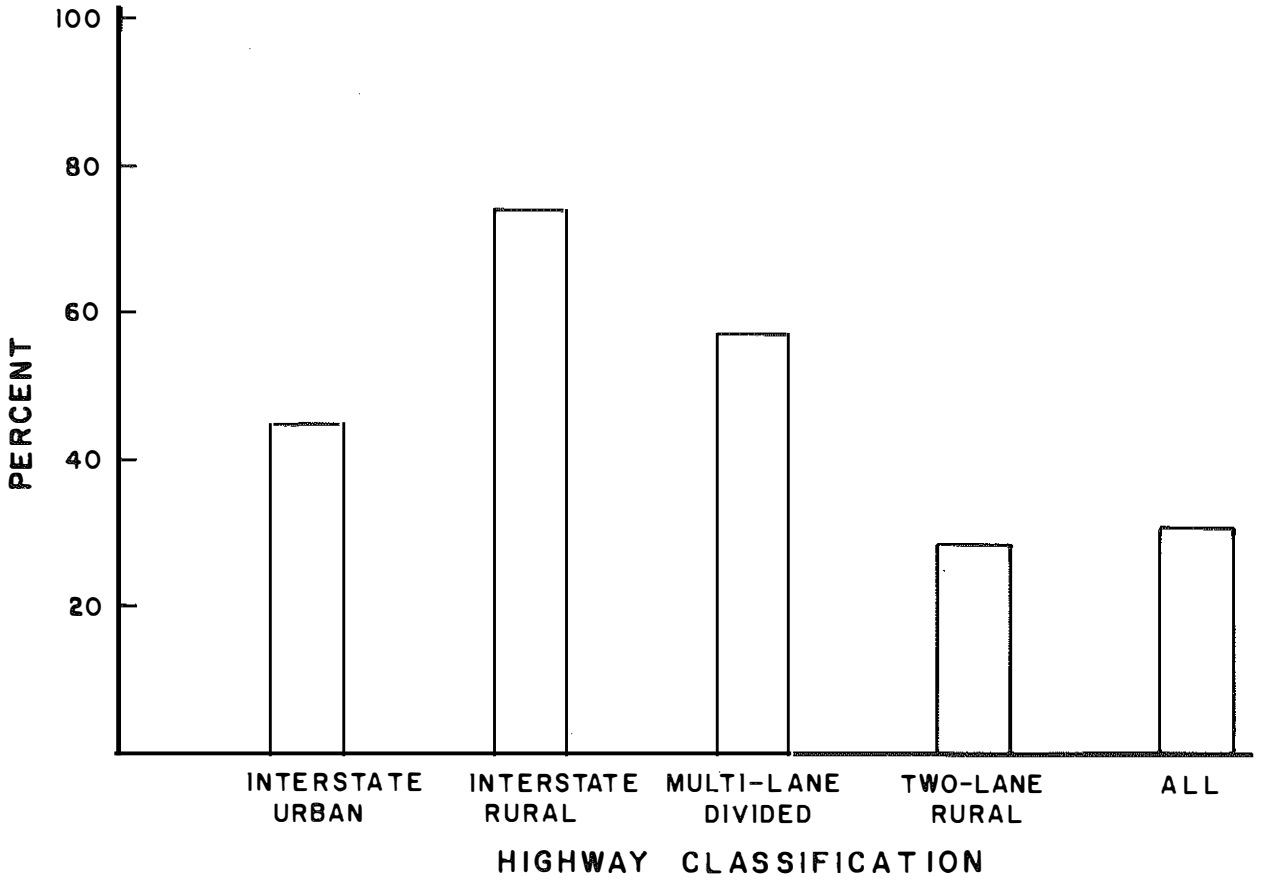

Figure 12. Percent of motorists exceeding 55 mph (1980 data).

Pedestrians

1. Pedestrian accidents were very severe compared to all accidents. Nearly 90 percent of the pedestrian accidents resulted in injuries and six percent resulted in fatalities.

2. Campbell and Kenton Counties had the highest pedestrian accident rates of any counties in the state. Newport and Covington had the highest rates for cities. Counties and cities with high pedestrian accident rates are shown in Figure 13.

3. As can be seen in Figure 13, a concentration of pedestrian accidents exists in northern Kentucky. Other problem areas include a line of high-rate counties (Carroll, Henry, Franklin, and Anderson) and the southeastern area of the state, which contains 9 of the state's 19 high-rate cities.

4. Over 60 percent of pedestrians involved in accidents were males, and over 25 percent were under the age of ten. Nearly 50 percent were from 10 to 34 years old, and just over 25 percent were 35 or older.

5. The most common contributing factors for pedestrian accidents were driver inattention and slippery surface.

6. The number of accidents involving pedestrians has remained constant over the three-year study period (1977-1979).

Bicycles

1. Bicycle accidents tended to be very severe, with nearly 80 percent resulting in injuries and two percent resulting in fatalities.

2. Daviess and Campbell Counties had the highest bicycle-accident rates of any counties in the state; Cold Springs, Bellevue, and Owensboro had the highest rates for cities. The locations of counties and cities with high bicycle-accident rates are shown in Figure 14.

3. As can be seen in Figure 14, all but one of the high-rate counties lie adjacent to the Ohio River. In addition, all of the high-rate cities are either

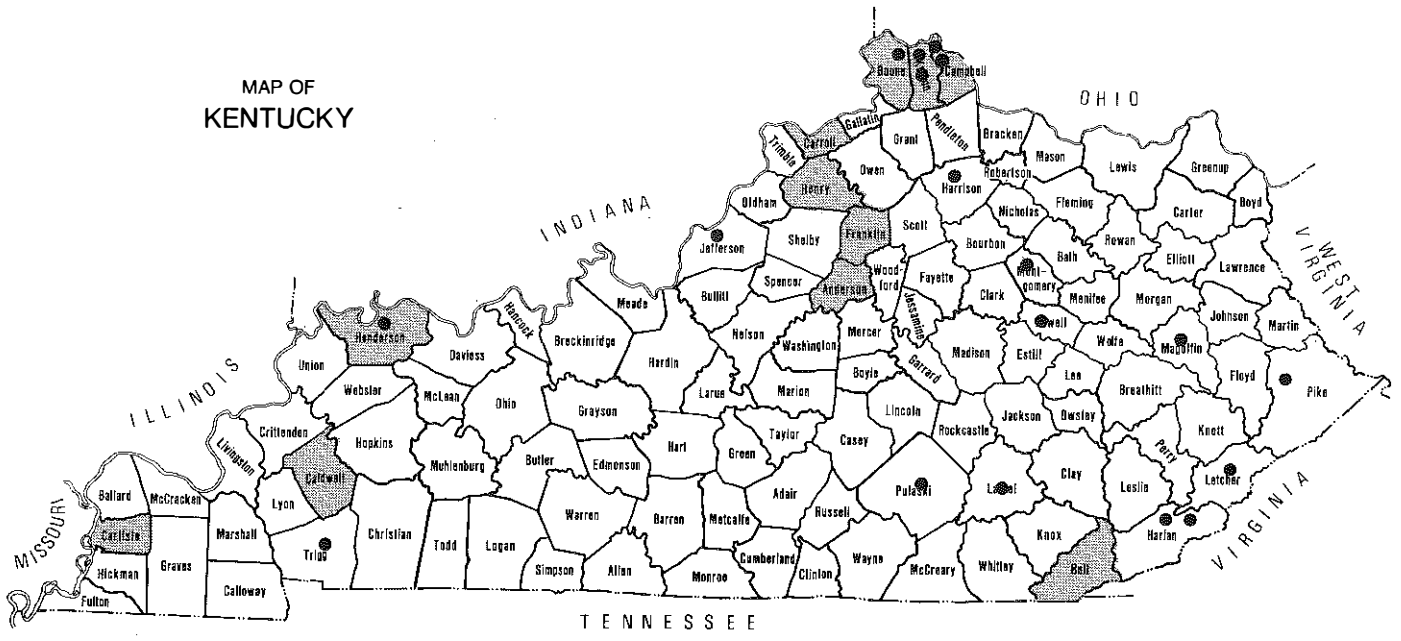

Figure 13. Counties and cities with high pedestrian accident rates.

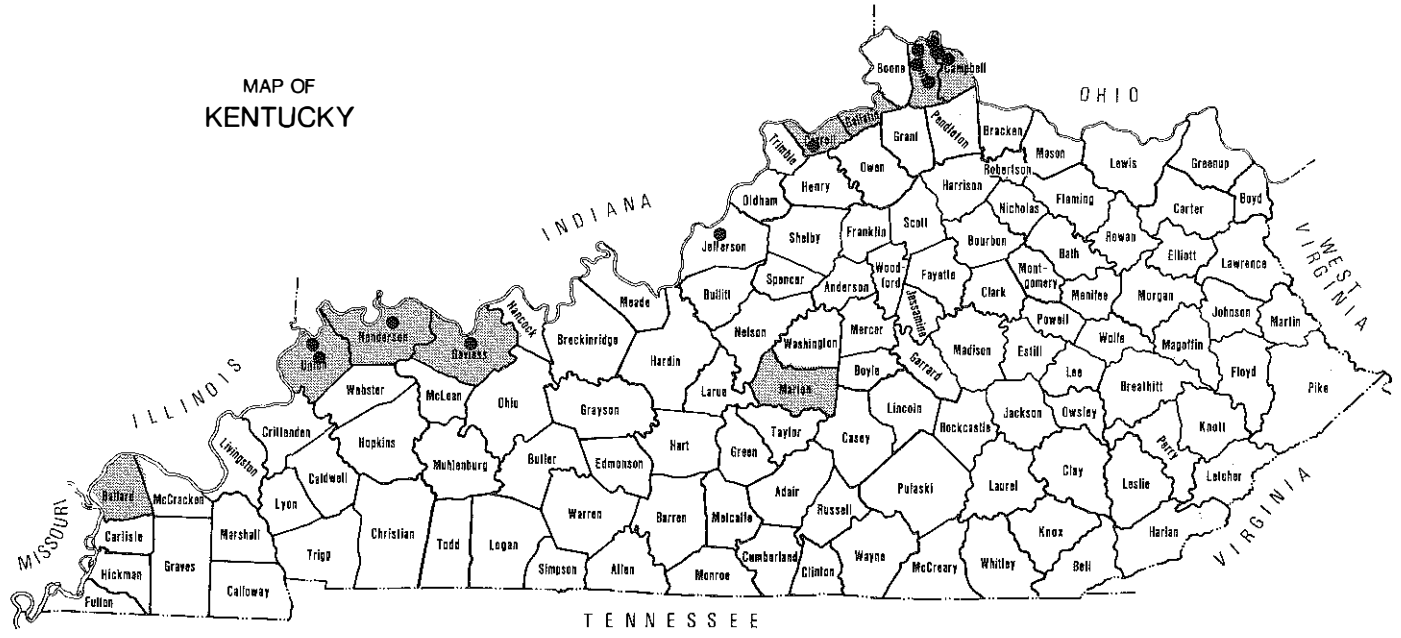

Figure 14. Counties and cities with high bicycle accident rates.

adjacent to the river or very close to it.

4. Over three-fourths of the bicyclists involved in accidents were males and nearly three-fourths were under the age of 16.

5. The most common contributing factors for motor-vehicle accidents involving bicycles were driver inattention and failure to yield right of way.

6. The number of accidents involving bicycles has remained fairly constant over the three-year study period.

Motorcycles

1. Motorcycle accidents tended to be very severe, with nearly three-fourths resulting in injuries and three percent causing fatalities.

2. McCracken and Warren Counties had the highest motorcycle-accident rates of any counties in the state; Marion and Radcliff had the highest rates for cities. Figure 15 shows the locations of counties and cities with high motorcycle-accident rates.

3. One problem area evident in Figure 15 is composed of Meade, Hardin, and Jefferson Counties, with five high-rate cities located in these three contiguous counties.

4. The most common contributing factors for motorcycle accidents were failure to yield right of way, driver inattention, and unsafe speed.

5. Motorcycles had a higher accident rate, in terms of accidents per 100 million vehicle miles (160 mvk), than passenger cars, single-unit trucks, combination trucks, or buses. The rates for these vehicle types are shown in Figure 16.

6. The number of accidents involving motorcycles has remained very constant over the three-year study period.

School Buses

1. Twelve counties were identified as having high rates of accidents involving school buses. The distribution of these counties across the state is shown in Figure 17.

2. The accident trend analysis shows that the number of accidents involving school buses has been increasing over the past three-year period, as shown in Figure 18.

3. School-bus accidents had a high percentage involving defective brakes.

4. School-bus accidents had a relatively low severity compared to other accidents.

Commercial Buses

1. Based on statewide accident rates

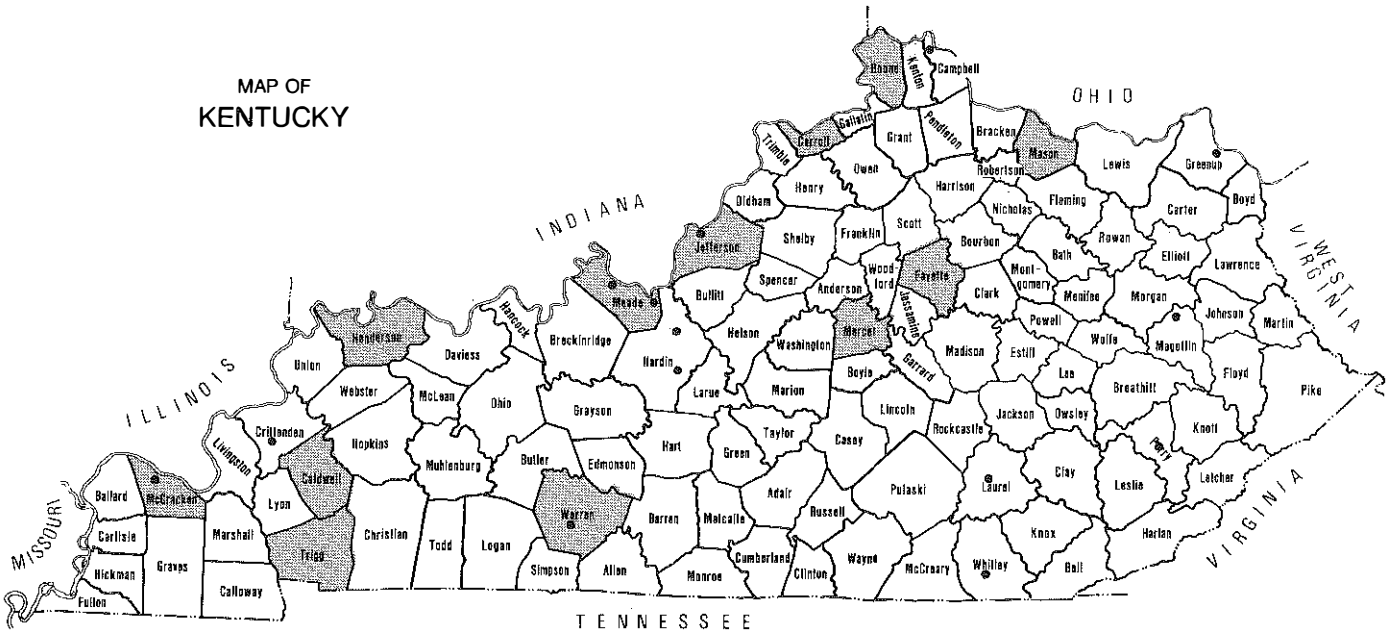

Figure 15. Counties and cities with high motorcycle accident rates.

in terms of vehicle-miles of travel, buses (commercial and school) had the highest rate of all vehicle types except for motorcycles (Figure 16).

2. The contributing factor categories of improper turning, brake failures, and improperly parked vehicles were overrepresented for accidents involving commercial buses.

3. Counties with the highest accident rates for commercial buses were Jefferson and Kenton.

4. There was a substantial reduction in the number of accidents involving commercial buses from 1977 to 1978 and again in 1979.

Combination Trucks

1. Statewide, total-accident rates show that combination trucks had the lowest rate of all vehicle types (Figure 16).

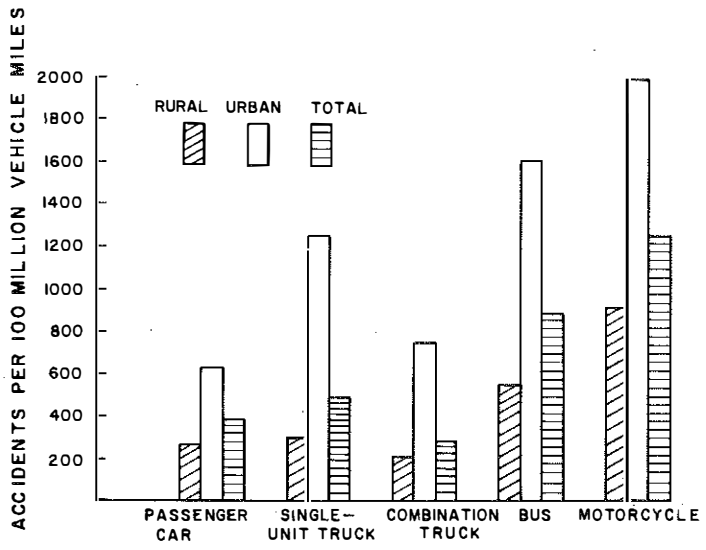

Figure 16. Statewide accident rates by vehicle type.

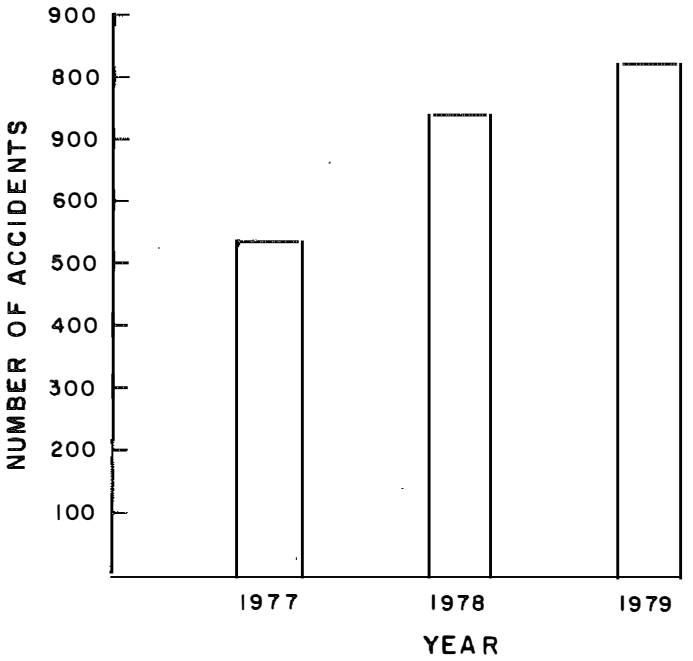

Figure 18. Trend in the number of accidents involving school buses over a three-year study period.

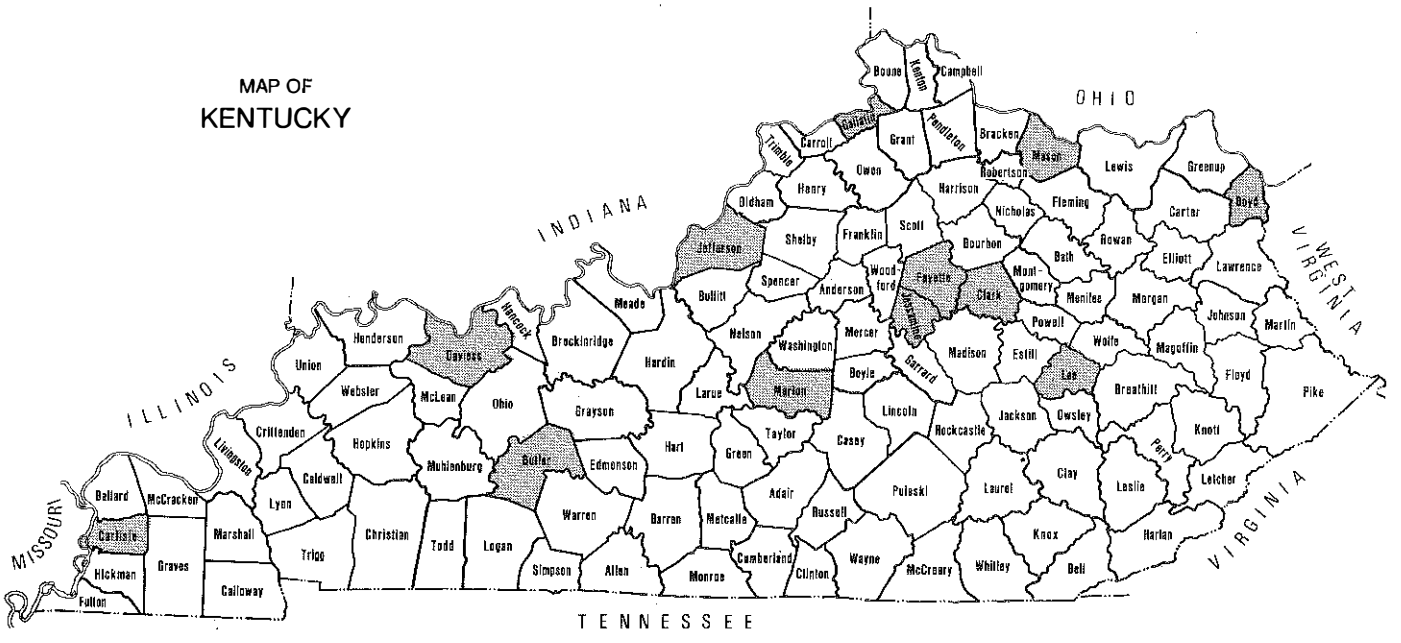

Figure 17. Counties with high rates of accidents involving school buses.

2. The percentage of fatal accidents involving combination trucks was three times the percentage for all accidents.

3. Counties with high accident rates for combination trucks were traversed by interstate routes, with the exception of Lawrence County. Boone and Gallatin Counties had the highest rates.

4. The number of accidents involving combination trucks in 1979 was slightly above the three-year study average.

Single-Unit Trucks

1. The statewide accident rate for single-unit trucks was 489 accidents per 100 MVM (160 MVK) as compared to 393 for passenger cars (Figure 16).

2. Most counties with high accident rates for single-unit trucks were either those traversed by interstate routes or those with high volumes of coal-truck traffic. Johnson and Jefferson Counties have the most severe accident problems with single-unit trucks.

3. There was a substantial decrease in accidents involving single-unit trucks in 1979.

Railroad Trains

1. Failure to yield right of way was a contributing factor in almost 26 percent of the train-related accidents.

2. Train-related motor-vehicle accidents were severe, with high percentages of fatal accidents and injury accidents.

3. Counties with the highest rates were Carroll and Webster; however, Jefferson County had the largest number of accidents.

4. There was a reduction in motor-vehicle accidents involving railroad trains in 1979.

Emergency Vehicles

1. The contributing factor categories of unsafe speed, failure to yield right of way, and slippery pavement were overrepresented in accidents involving emergency vehicles.

2. Gallatin and Grant Counties had the highest accident rates per 10,000 population for emergency vehicles. The highest numbers of accidents involving emergency vehicles occurred in Jefferson,

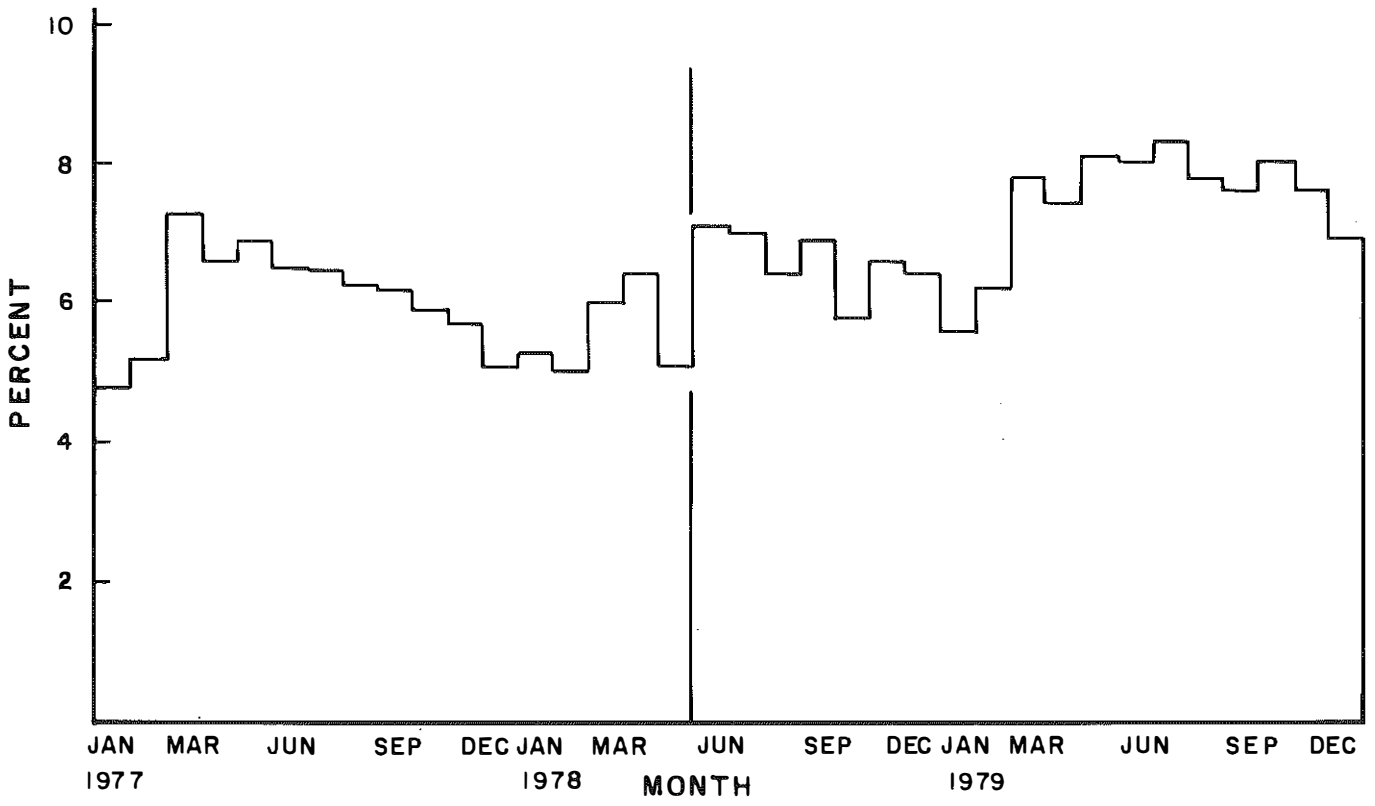

Figure 19. Trend in the percentage of all accidents involving vehicle defects after repeal of the vehicle inspection law.

Fayette, and Kenton Counties.

3. There has been an increase in accidents involving emergency vehicles over the three-year study period.

Vehicle Defects

The percentage of accidents involving vehicle defects has increased since repeal of the vehicle inspection law. The trend in the percentage of all accidents involving a vehicle defect after repeal of the vehicle inspection law is shown in Figure 19.

Emergency Services Arrival Times

1. The time from notification to arrival of emergency services at the scene of a motor-vehicle accident was over 10 minutes at least 50 percent of the time in 27 counties. Counties with longest response times are shown in Figure 20.

2. Campbell County had the shortest response times in the state; Menifee County had the longest.

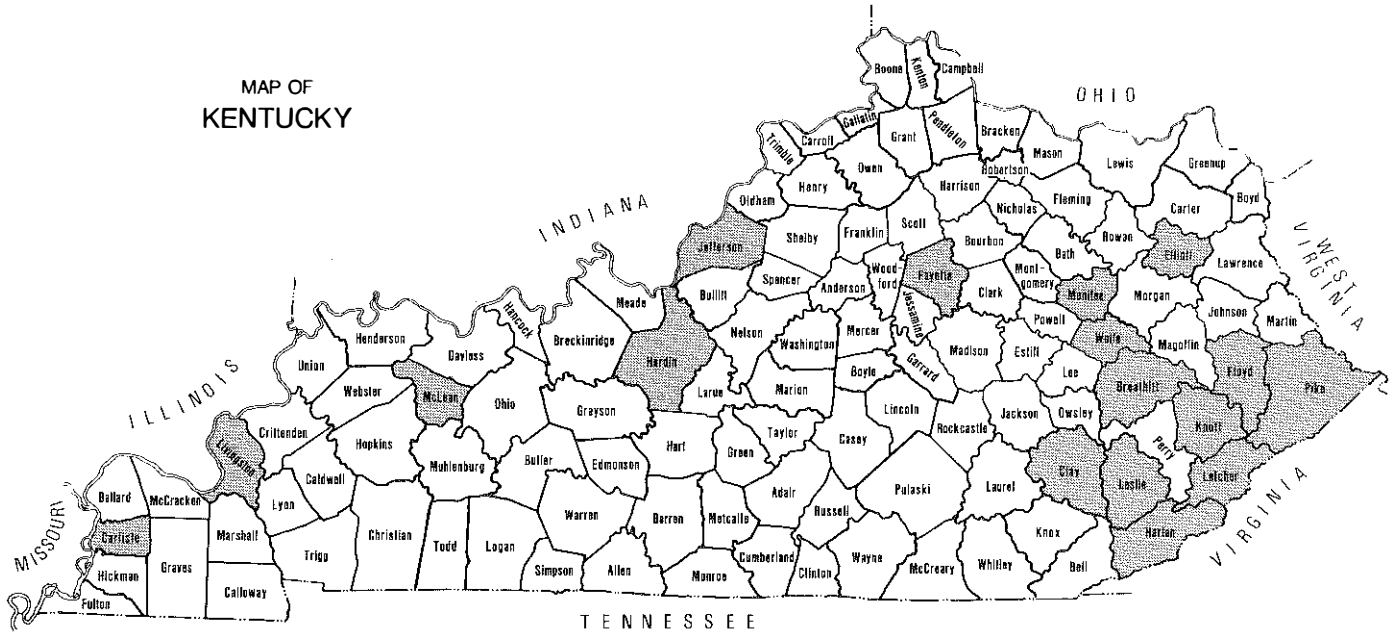

Figure 20. Counties with long emergency services response times.

Recommendations

A total of 24 problem identification areas were investigated. While numerous potential accident problems were identified, some of the problem areas should be emphasized. Those areas are speed-related accidents, alcohol-related accidents, seatbelt usage, child restraints, school-bus accidents, and vehicle defects. Following is a summary of possible safety projects that could be implemented for each problem area.

Speed-Related Accidents

Unsafe speed was listed most often as a contributing factor in fatal accidents. It was listed as a contributing factor in 36.2 percent of all fatal accidents. It was also listed as a contributing factor in 9.1 percent of all accidents. Therefore, methods of reducing unsafe speeds are needed. Increased enforcement combined with public information could be utilized in counties and cities identified as having a problem with speed-related accidents. Counties and cities with large percentages of accidents involving speeding and with speeding-violation rates below the average for their population categories were identified in Table 28. These counties and cities are candidates

for increased enforcement.

Alcohol-Related Accidents

Alcohol was listed as the second leading factor in fatal accidents (23.5 percent) and was listed as a factor in 6.4 percent of all accidents. Increased enforcement and public awareness of the problem are possible countermeasures. Counties and cities having high percentages of accidents involving alcohol and low alcohol violation rates have been identified (Table 29) and would be the logical locations for implementation of increased enforcement.

Seatbelt Usage

The use of seatbelts is a cost-effective means of reducing accident severity. Their effectiveness has been demonstrated using Kentucky accident data. However, seatbelt usage has remained very low, and usage rates for drivers involved in accidents actually declined in the three-year study period. Therefore, efforts to increase seatbelt usage are warranted. While publicity campaigns historically have had only limited success, such efforts in a few trial counties may be worthwhile. One county from each population category is given in Table 33 as a prospective location for such campaigns. These counties were selected based on a combination of low seatbelt usage and high accident rates. Mandatory seatbelt legislation is the ultimate method to use to increase seatbelt usage. While legislation requiring all vehicle occupants to wear seatbelts would create a great deal of opposition, a law only requiring drivers of certain vehicle types to wear seatbelts could have a possibility of being passed. Drivers of certain types of vehicles such as school buses and emergency vehicles would be included. While this would only affect a limited number of drivers, passage of such a law would emphasize the importance of seatbelt usage and might have an effect on overall usage rates.

Child Restraints

More detailed research should be done to determine the effectiveness of specific child restraints in reducing accident severity and whether the effective restraints are being used properly. Laws requiring the use of child restraints for children under a certain age (such as five years) have been passed in at least two states. Passage of such a law would be the best method to increase the existing low child-restraint usage rates in Kentucky. Public opinion in Kentucky has been shown to be favorable to such a law (12). Therefore, emphasis should be placed on passage of a law requiring mandatory child-restraint usage. Increased child-restraint usage would increase the importance of determining the effectiveness of specific child restraints and identifying improper methods of use.

School Bus Accidents

There has been a general increase in accidents involving school buses over the three-year study period. This indicates a need for such a countermeasure as additional training for school-bus drivers. Counties having the highest rates of accidents involving school buses are identified in Table 43 by population category. These counties are candidates for additional driver training. The analysis of contributing factors for this type of accident shows the type of information that could be presented in such training.

Vehicle Defects

The percentage of accidents involving vehicle defects has been increasing since repeal of the vehicle inspection law. A more detailed analysis of the defects involved and whether these defects might have been detected in the previous vehicle inspection program is warranted.

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